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DECISION DOCUMENT COAL STORAGE AREA 3 AND LANDFILL 5 REVISION 4 FORT SHERIDAN IL
11/5/2004
TETRA TECH EM, INC

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DECISION DOCUMENT
COAL STORAGE AREA 3
AND LANDFILL 5
Fort Sheridan Environmental Restoration Project

05 November 2004

Revision 4

Prepared for:

U.S. Army FORSCOM BRAC OFFICE
DSCPIM ATTN AFPIBC
1347 Thorne Avenue, BLDG 243
Fort McPherson, Georgia 30330

Prepared by:

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10 November 2004

Mr. Victor Bonilla
Department of the Army
BRAC Division
Atlanta Field Office
1347 Thorne Avenue SW, Building 243
Fort McPherson, Georgia 30330-1062

Re: Coal Storage Area 3 and Landfill 5 Decision Document, Revision 4.0, 05 November 2004
Fort Sheridan Environmental Restoration Project
Fort Sheridan, Illinois

Dear Mr. Bonilla:

Please find enclosed six (6) copies of the Coal Storage Area 3 (CSA 3) and Landfill 5 (LF 5) Decision Document, Revision 4.0, dated 05 November 2004, for the Department of Defense Operable Unit, Fort Sheridan, Illinois.

This version of the Decision Document incorporates all revisions from the Department of the Army's legal counsel, as well as changes made in response to recent Illinois EPA comments on Revisions 2.0 and 3.0. The Response to Illinois EPA Comments on the Revision 3.0 is included in the front cover of the document, for reference.

In a 09 November 2004 email to your attention, Illinois EPA indicated that changed incorporated into Revision 4.0, 05 November 2004 adequately addressed the Agency's comments, and that the Agency has no further comments. Illinois EPA is anticipating receipt of the Decision Document for signature by the Director, in accordance with the procedures you outlined in your 09 November 2004 emails to Mr. Brian Conrath.

If you have any questions regarding the CSA and Landfill 5 Final Decision Document, please contact Larry Emerson (847-266-1350 or lemerson@kemron.com).

Sincerely,
KEMRON Environmental Services, Inc.

Fort Sheridan Restoration Team
Project Manager

DEPARTMENT OF THE ARMY
BASE REALIGNMENT AND CLOSURE
ATLANTA FIELD OFFICE
1777 HARDEE AVENUE, SW
FORT MCPHERSON, GEORGIA 30330-1062

NOVEMBER 10, 2004

Mr. Brian A. Conrath
Illinois Environmental Protection Agency
1021 N. Grand Avenue
Springfield, Illinois 62794-9276

Subject: **Coal Storage Area 3 and Landfill 5 Decision Document Revision 4.0, 05 November 2004, Fort Sheridan Environmental Restoration Project**

Dear Mr. Conrath:

Enclosed please find three (3) copies of the Coal Storage Area 3 and Landfill 5 Decision Document, Department of Defense Operable Unit, Fort Sheridan, Illinois, Revision 4.0, dated 05 November 2004.

The Decision Document has been prepared to incorporate all changes to date. The Illinois EPA reviewed this document electronically, and indicated in a 09 November 2004 email to the Army that the Agency's comments have been adequately addressed. The Army is therefore issuing the Decision Document for signature by all appropriate parties.

The Army will proceed with issuance of the document for signature as indicated in my 09 November 2004 emails to your attention. In the interim, the enclosed copies are provided for the Agency's files. Please contact Kurt Thomsen, Fort Sheridan EC, if any questions arise.

Sincerely,

for

Victor Bonilla
Forces Command
BRAC Division

cc: Chaouki Tabet (1) – Headquarters Department of the Army
Kurt O. Thomsen (1) – Fort Sheridan Environmental Coordinator
Dan Fleming (1) – US Navy
David Moore (2) – USARC
Jeff Leach (2) - USACHPPM
Chris Boes (1) – AEC Representative
Brian Conrath (3) – Illinois EPA
Eric Johnson (1) – US Army Reserve State Environmental Mgr.
Bill Walters (1) – Regional Support Command
Tony Nesky (1) – Army Regional Environmental Coordinator, Region 5
Mindy Gould (1) – Tetra Tech
Patrick Brennan (1) - Highland Park Assistant City Manager
Paul P. Diambri, Esquire (1) – Attorney, City of Highwood
Robert R. Kiely, Jr. (1) - Lake Forest City Manager
Larry Emerson (3) – KEMRON Senior Engineer
Tracy Bergquist (1) – KEMRON GFPR Project Manager

Department of the Army Responses to Illinois EPA 27-October-2004 Comments and Verbal Comments of 04-November-2004
Coal Storage Area 3 and Landfill 5 Decision Document, Revisions 2 and 3

1. **Comment:** Section 1.2 – The last sentence states, "The State of Illinois and the U.S. Environmental Protection Agency (U.S. EPA) concur with the selected remedies." Did the U.S. EPA officially concur with the remedies? The U.S. EPA letters that I have found, which are in regards to the Proposed Plan, state that the U.S. EPA non-concurs. This section should state what each of the regulatory agencies concurred or non-concurred with (e.g. Proposed Plan and Decision Document), and also explain that U.S. EPA withdrew from the BCT and all subsequent document review and oversight duties at Fort Sheridan on October 3, 2003, following the Army's elimination of U.S. EPA funding for such activities.

   Response: Section 1.2 has been amended as requested.

2. **Section 1.4.2** – In the second paragraph following the third bullet, the word "feed" should be "feet." Please correct.

   Response: The paragraph has been changed as requested.

3. **Section 2.4** – In the third paragraph, the Responsiveness Summary should be referenced to Appendix B, instead of Appendix A.

   Response: The paragraph has been changed as requested.

4. **Section 2.6** – In the large paragraph on page 2-8, the Landfill 5 contaminants of concern in soil are stated as being at a depth of less than or equal to 1 foot below ground surface. This statement is accurate as far as it goes, but it does not fully describe the entire range for the contaminants of concern found in the waste and subsurface soil at Landfill 5. That information needs to be provided here as well. Table 2.2-10 in the Final Feasibility Study provides the range of contaminant concentrations as well as the depth at which they were found and is broken down into depth ranges of ≤ 1 feet below land surface (this matches what has been reported here), 1 to 10 feet below land surface, and >10 feet below land surface. These last two ranges were omitted from this section. Without this information, the Site Characteristics Section is misleading. Please include the missing information here.

   Response: The requested information was added to Revision 3 of the Decision Document. During the 04-November-2004 on-site meeting of Brian Conrath, Illinois EPA, Kurt Thomsen, Ft. Sheridan EC, and Larry Emerson, KEMRON, additional language clarification was requested. To address the Agency's comment, the language in question has been revised, and two paragraphs have been inserted, stating the following:

   > "The COCs at both sites are found in the soil. For CSA 3, COCs are PAHs detected at concentrations from 0.072 to 6.8 µg/g at a depth of less than or equal to 1 foot bgs. At a depth of 1 to 10 feet bgs, the COCs are PAHs at concentrations from 0.00004 to 21.2

µg/g. At a depth greater than 10 feet bgs COCs are PAHs at concentrations from 0.00023 to 0.00055 µg/g.

Landfill 5 COCs at a depth of less than or equal to 1 foot bgs are PAHs at concentrations from 0.007 to 100 µg/g and lead at concentrations of 2.48 to 1,400 µg/g. Landfill 5 COCs at a depth of 1 to 10 feet bgs are PAHs at concentrations from 0.0052 to 70 µg/g and lead at concentrations of 6.4 to 2,600 µg/g. Finally, Landfill 5 COCs at a depth of greater than 10 feet bgs are PAHs at concentrations from 0.02 to 10 µg/g and lead at concentrations of 0.99 to 3,600 µg/g."

This revised language is included in the Decision Document Revision 4.0, dated 05-November-2004.

5. **Section 2.6.4.2** – The period is missing at the end of the last sentence.

   Response: The sentence has been changed as requested.

6. **Section 2.7.2** – In the one sentence third paragraph, the word "were" should be deleted.

   Response: The sentence has been changed as requested.

7. **Section 2.8.1** – In the fourth paragraph on page 2-13, the first sentence states that waste and contaminated subsurface soil are located from the surface to about 2 feet below ground surface. This is obviously inaccurate. The Final Feasibility Study (FS), in Section 2.2.1.5, lists the maximum depth of waste materials encountered in Landfill 5 as 34 feet below land surface. In Table 2.2-10 of the FS, lead contamination as high as 3600 ug/g is reported at a depth of 22 feet. Please verify the correct depth range for contaminants at Landfill 5 and revise the text accordingly.

   Response: The missing number has been inserted, and the paragraph now reads as requested.

8. **Section 2.11.1.3** – Following the second bullet, two sentences have been deleted. The first sentence, which spelled out the land use control objectives for this alternative needs to be replaced.

   Response: The paragraph has been changed as requested.

9. **Section 2.11.2.2** – Following the first bullet on page 2-24, the sentence mentions the restriction or prohibition on residential use twice. One reference is sufficient.

   Response: The paragraph has been changed as requested.

10. **Section 2.11.2.5** – The last sentence following the fifth bullet should be removed. There is no LUCMOA for this site.

    Response: The sentence has been removed.

11. **Section 2.11.2.8** – Another key component of the remedy that should be mentioned in the bulleted items is the installation of groundwater monitoring wells and the collection of groundwater samples.

Response: This item was revised to indicate that groundwater monitoring wells will be installed, and groundwater samples will be collected in accordance with the design document approved by Illinois EPA.

12. **Section 2.11.2.8** – The estimated annual O & M cost appears to be incorrect. Please determine the proper value and revise accordingly.

    Response: The annual O & M cost has been updated to match the language in Table 5.

13. **Section 2.11.2.8** – Is the estimated total present worth cost value accurate? The estimated capital costs have increased more than 400,000 dollars, when compared to the this same section in the draft version of this document, but the estimated total present worth cost only increased by slightly more than 100,000 dollars. Additionally, the values listed for this alternative in Tables 3 and 5 do not match the value listed here. Please review the information provided in this section, determine the appropriate values, and revise this document accordingly.

    Response: The text and the tables have been revised. The estimated capital costs included in the draft decision document were superseded by more accurate costs in the remedial design document approved by Illinois EPA. In addition, standard cost estimate disclaimer language from U.S. EPA guidance has been added to this section to reflect the range of the acceptable cost estimate.

14. **Section 2.11.2.8** – Why is the total present worth cost provided in 2003 dollars? The annual O & M costs and groundwater sampling should be accounted for over a 30-year period, as were alternatives 2 and 3. Illinois EPA has not agreed to the discontinuance of the groundwater monitoring at the end of five years. What was agreed upon was that the Army could submit a request to terminate groundwater sampling or reduce the frequency of monitoring after five years. The Agency would make that determination upon receipt of the Army's request and that determination would be based upon the groundwater data collected and submitted to that point. There is the distinct possibility that groundwater monitoring would be required to continue passed the five-year point. Please revise accordingly, or provide justification of why it should be treated differently. At a minimum, there should be a footnote to the table stating that the listed groundwater monitoring costs only apply if the groundwater monitoring is terminated at the end of the first five years of monitoring. It should also point out that groundwater monitoring might well be required for up to 30 years or more.

    Response: This cost estimate has been superseded by more accurate costs in the Landfill 5 design document approved by Illinois EPA. In addition, standard cost estimate disclaimer language from U.S. EPA guidance has been added to this section to reflect the range of the acceptable cost estimate. A footnote explaining this has been added to Table 5.

15. **Table 3** – The estimated total present worth costs for CSA 3 and Landfill 5 do not match the text or Tables 4 and 5. Please revise as appropriate.

    Response: The text has been amended to agree with the tables. The value of Total Cost for CSA 3 of $188,000, as listed in Table 3 of Revision 3 has been changed to $ 204,000.

16. **Table 3** – The notes at the bottom of the table do not explain the numbers found in the table appropriately. In addition, there is no definition for the entry "UA". Please review this table and revise as necessary.

    Response: Table 3 has been revised as requested.

17. **Section 2.14.2** – In the second sentence on page 2-42, it states signs will be placed along the area adjacent to CSA 3. This should state Landfill 5, rather than CSA 3.

    Response: The requested correction has been made.

18. **Section 2.14.2** – In the fourth paragraph on page 2-42, the sentence beginning with "A geomembrane," was revised according to the Agency's suggestion (Comment no. 65) on the Draft Decision Document. However, part of the suggested language was left out. That part, which read, "*compacted to attain a hydraulic conductivity value of 1 x 10^{-5} cm/sec.*", should be reinserted.

    Response: The requested language has been added.

19. **Table 5** – There are several abbreviations that are not defined in the notes following the table. They should either be spelled out or defined. Those abbreviations are "ea", "Sy", and "sf".

    Response: The abbreviations have been defined.

DECISION DOCUMENT
COAL STORAGE AREA 3
AND LANDFILL 5
Fort Sheridan Environmental Restoration Project

05 November 2004

Revision 4

Prepared for:

U.S. Army FORSCOM BRAC OFFICE
DSCPIM ATTN AFPIBC
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LIST OF ACRONYMS

ARAR	Applicable or relevant and appropriate requirement
BERA	Baseline ecological risk assessment
bgs	Below ground surface
BRA	Baseline risk assessment
BRAC	Base Realignment and Closure (Act of 1990)
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
cm/sec	Centimeter per second
COC	Chemical of concern
CSA	Coal Storage Area
DD	Decision document
DoD	U.S. Department of Defense
EPIC	Environmental Photographic Interpretation Center
ESE	Environmental Science and Engineering, Inc.
FFS	Focused feasibility study
FS	Feasibility study
HHRA	Human health risk assessment
HI	Hazard index
HTTD	High-temperature thermal desorption
IAC	Illinois Administrative Code
IGLD	International Great Lakes Datum
Illinois EPA	Illinois Environmental Protection Agency
ISGS	Illinois State Geological Survey
ISWS	Illinois State Water Survey
LUC	Land use control
MOA	Memorandum of agreement
msl	Mean sea level
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
O&M	Operation and maintenance
OU	Operable Unit
PA	Preliminary assessment
PAH	Polycyclic aromatic hydrocarbon
PCB	Polychlorinated biphenyl
PP	Proposed plan
RAB	Restoration Advisory Board
RAO	Remedial action objective
RCRA	Resource Conservation and Recovery Act
RfD	Reference dose
RI	Remedial investigation
SARA	Superfund Amendments and Reauthorization Act of 1986
SOP	Standard operating procedure
SVOC	Semivolatile organic compound
USAEC	U.S. Army Environmental Center
U.S. EPA	U.S. Environmental Protection Agency
UST	Underground storage tank
VES	Vehicle equipment storage
VOC	Volatile organic compound

1.0 THE DECLARATION

1.1 SITE NAME AND LOCATION

Fort Sheridan, EPA ID number IL2210020838, is located in Lake County, Illinois, along the western shore of Lake Michigan, approximately 25 miles north of Chicago, Illinois, and 18 miles south of the Wisconsin state line along the western shore of Lake Michigan. Fort Sheridan was divided into two operable units (OU) to facilitate the transfer of surplus government property under the Base Realignment and Closure (BRAC) program. This decision document (DD) addresses two U.S. Department of Defense (DoD) OU sites, Coal Storage Area (CSA) 3 and Landfill 5. The locations of these sites are shown on Figure 1.

1.2 STATEMENT OF BASIS AND PURPOSE

This DD presents the selected remedies for CSA 3 and Landfill 5 at the DoD OU of Fort Sheridan, which were chosen in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), and, to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). These decisions are based on the Administrative Record file for the DoD OU of Fort Sheridan. Finally, this DD references all previous DDs for sites on the DoD OU. The State of Illinois concurred with the selected remedies. The U.S. EPA did not concur with the selected remedies. The U.S. EPA withdrew from document review and oversight at Fort Sheridan on October 3, 2003, following the Army's elimination of U.S. EPA funding for such activities.

1.3 ASSESSMENT OF THE SITE

The response actions selected in this DD are necessary to protect the public health or welfare and the environment from actual or threatened releases of hazardous substances into the environment.

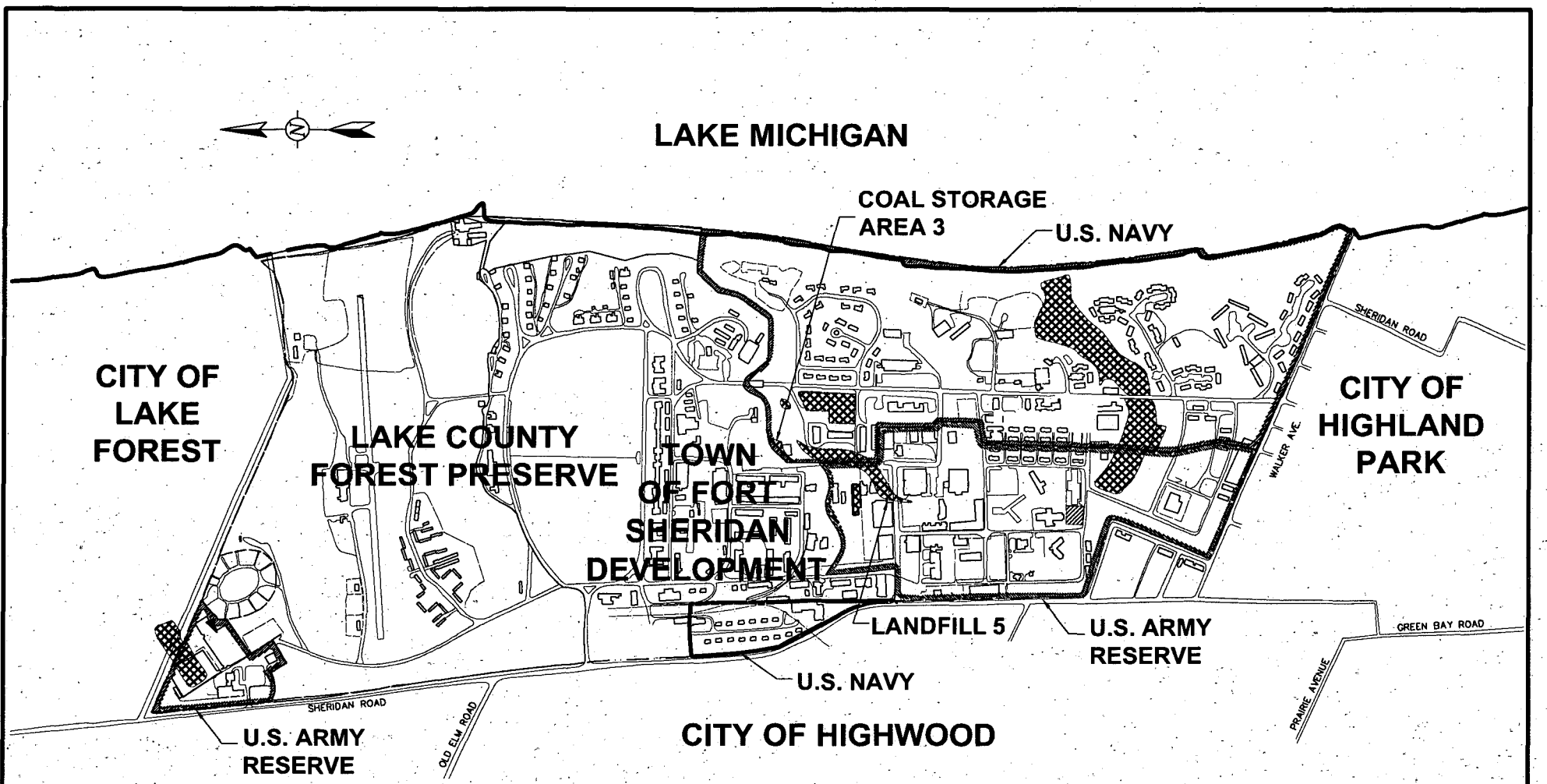
1.4 DESCRIPTION OF SELECTED REMEDY

1.4.1 Coal Storage Area 3

The Army's selected remedy for CSA 3 is a hybrid of Alternatives 2 and 4 from the feasibility study (FS). It combines elements of the limited action and off-site disposal alternatives. It includes erosion controls designed to protect the ravine slope immediately east of CSA 3 and excavation of areas where polycyclic aromatic hydrocarbon (PAH) concentrations exceed remedial action objectives (RAOs) at depths of less than 4 feet below ground surface (bgs). In addition, land use controls (LUCs), monitoring, and maintenance would be required.

The major components of the selected remedy include the following:

- Erosion controls will be installed.
- Two areas at the northern end of CSA 3 will be excavated and covered with topsoil.
- The ravine will be monitored to ensure the effectiveness of the remedial alternative, and maintenance or further improvements will be implemented as needed.
- The ravine slope will be thinned of excess, predominantly mid-story, non-native vegetation and seeded with a mix of native groundcover to improve erosion control along the slope.



LEGEND

▨ - DOD OPERABLE UNIT AREAS

KEMRON Fort Sheridan Environmental Tetra Tech EM, Inc. Restoration Team	NOT TO SCALE	FIGURE 1	SITE LOCATION MAP DECISION DOCUMENT FORT SHERIDAN, ILLINOIS

- LUCs will be implemented for CSA 3. The LUC objectives for this alternative are:
  - Ensure no residential use or residential development of the property.
  - Ensure no construction, excavation of, breaching of, or any other intrusive activities on the landfill.
- The actual implementation actions to achieve these LUC objectives will be described in detail in the remedial design document for the selected alternative. Until such a time that CSA 3 is transferred out of federal government ownership, physical engineered LUCs, such as fences and signs, will be used to contain contamination and restrict access to the site. Should CSA 3 be transferred out of federal government ownership in the future, legal LUCs, as codified in 35 Illinois Administrative Code 742.1010, such as deed restrictions, shall be used to achieve the LUC objectives. These LUCs are designed to prevent any intrusive activities at the top, bottom, or down the slope of the ravine, monitoring and maintaining the integrity of the cover soils, and prohibiting residential re-use. The Illinois EPA considers these objectives minimum requirements for a remedy that is protective of human health and the environment. To implement these objectives, the Army, in conjunction with the Navy, will restrict future excavation or construction to limit potential human contact with elevated concentrations of contaminants in the below grade soil and other below grade material at CSA 3.

  All LUCs will be included in the 5-year reviews required under CERCLA and NCP, as well as any more frequent monitoring and reporting required.

1.4.2 Landfill 5

The Army's selected remedy for Landfill 5 is a hybrid of Alternatives 2 and 6 from the FS. It combines elements of the limited action and capping alternatives. Erosion controls similar to those planned for CSA 3 will be implemented to protect the ravine slope adjacent to the north end of the landfill. Although the remedial investigation (RI) concluded that there is no risk to groundwater at Landfill 5, groundwater monitoring will be conducted to ensure the protectiveness of the alternative is maintained.

The major components of the selected remedy include the following:

- Site preparation will include identification of utility locations and clearance of obstacles or vegetation that would interfere with implementation.
- Select concrete corings may be performed to determine the nature and thickness of the roadway at 1st Street.
- An engineering study will be conducted to determine whether or not the sub-base materials in areas currently covered by asphalt in good repair are consistent with the to-be-constructed cap materials; if they are, the areas will not be disturbed.

  Asphalt areas in poor condition will be removed to a depth that provides for replacement of both the asphalt and an additional 2 feet of clay overlaying a geocomposite liner. Some grading may be conducted across the unit for drainage and to provide elevations that allow for future use as required.

No excavation or off-site disposal of soil or landfill waste is expected to be needed. The sub-base will be compacted and smooth-rolled allowing for proper placement of the geomembrane layer.

- A geomembrane, such as Claymax® or similar material with a hydraulic conductivity value of 1 x 10^{-7} cm/sec will be placed over the graded sub-base and two feet of clay will be placed over the geomembrane and compacted to create a low-permeability cover with an hydraulic conductivity of less than or equal to 1 x 10^{-7} cm/sec. Depending on the planned use for a particular area, either 12 inches of asphalt/aggregate (9 inches of sub-base plus 3 inches of asphalt for parking) or six inches of topsoil (for greenspace) will be placed over the clay. The topsoil will be vegetated to minimize loss of topsoil from erosion.

- The ravine slope will be thinned of excess, predominantly mid-story, non-native vegetation and seeded with a mix of native groundcover to improve erosion control along the slope.

- LUCs will be implemented for Landfill 5. The LUC objectives for this alternative are:

  - Ensure no residential use or residential development of the property.

  - Ensure no construction, excavation of, breaching of, or any other intrusive activities on the landfill.

- The actual implementation actions to achieve these LUC objectives will be described in detail in the remedial design document for the selected alternative. Until such a time that Landfill 5 is transferred out of federal government ownership, physical engineered LUCs, such as fences and signs, will be used to contain contamination and restrict access to the site. Should landfill 5 be transferred out of federal government ownership in the future, legal LUCs, as codified in 35 Illinois Administrative Code 742.1010, such as deed restrictions, shall be used to achieve the LUC objectives. These LUCs are designed to prevent any intrusive activities at the top, bottom, or down the slope of the ravine, monitoring and maintaining the integrity of the cover soils, and prohibiting residential re-use. The Illinois EPA considers these objectives minimum requirements for a remedy that is protective of human health and the environment. To implement these objectives the Army, in conjunctions with the Navy and Army Reserve, will restrict future excavation or construction to limit potential human contact with elevated concentrations of contaminants in the below grade soil and other below grade material at Landfill 5.

- The Army in conjunction with the Navy and Army Reserve will be responsible for implementing and maintaining LUCs. The current owners (Navy and Army Reserve) agree that the post closure use of the property will be regulated to assure that no damage will be allowed in the cap area. The future uses of the property will be consistent with the current use and will include parking, roadways, sidewalks and open space. Residential use will not be allowed in the defined cap area.

- All LUCs will be included in the 5-year reviews required under CERCLA and NCP, as well as any more frequent monitoring and reporting required.

1.5 STATUTORY DETERMINATIONS

The selected remedies are protective of human health and the environment, comply with federal and state requirements that are applicable or relevant and appropriate to the remedial action, are cost-effective, and use permanent solutions to the maximum extent practicable.

The remedies for CSA 3 and Landfill 5 in this OU do not satisfy the statutory preference for treatment as a principal element of the remedy because treatment was not determined to be readily implementable or cost-effective.

Because the selected remedies for CSA 3 and Landfill 5 will result in hazardous substances, pollutants, or contaminants remaining on site at concentrations above levels that allow for unlimited use and unrestricted exposure, a statutory review will be conducted no less often than five years after initiation of remedial action and every five years thereafter for as long as needed to ensure that the remedy is, or will be, protective of human health and the environment.

1.6 DATA CERTIFICATION CHECKLIST

The following information is included in the Decision Summary section of this decision document for each of the remedial action sites. Additional information is located in the administrative record file for this site.

- Chemicals of concern (COCs) and their respective concentrations
- Baseline risk represented by COCs
- Cleanup levels established for COCs and the basis for these levels
- How source materials constituting principal threats are addressed
- Current and reasonably anticipated future land use assumptions and current and potential future beneficial uses of groundwater used in the baseline risk assessment and the decision document
- Potential land and groundwater use available for the site as a result of the selected remedy
- Estimated capital, annual operation and maintenance (O&M), and total present worth costs, discount rate, and the number of years over which the remedy cost estimates are projected
- Key factors that led to selecting the remedies (describing how the selected remedies provide the best balance with respect to the criteria, highlighting criteria key to the decision).

1.7 AUTHORIZING SIGNATURES

This DD was developed in accordance with current U.S. EPA guidance documents for remedial actions under CERCLA. The purpose of this document is to identify and analyze alternative actions to address waste and contaminated subsurface soil at CSA 3 and Landfill 5. Five alternatives are identified and evaluated for CSA 3:

- No action;
- Limited action;
- In situ solidification/stabilization;
- Off-site disposal; and
- Limited action with targeted excavation.

Eight alternatives are identified and evaluated for Landfill 5:

- No action;
- Limited action;
- In situ solidification and stabilization;
- High-temperature thermal desorption (HTTD) chemical extraction, and on-site disposal;
- Chemical oxidation, chemical extraction, and on-site disposal;
- Capping;
- Off-site disposal; and
- Limited action with cover.

The U.S. Army's remedial alternative for CSA 3 is Limited Action with Targeted Excavation. The remedial alternative for Landfill 5 is Limited Action with Cover. These alternatives satisfy the threshold remedy selection criteria: protection of human health and the environment, and compliance with applicable or relevant and appropriate requirements (ARAR). In addition, the Army considers these alternatives to be cost–effective solutions that will provide long-term protection. The alternatives can be readily implemented with minimal short-term risks to on-site workers, the community, and the environment.

Remedies for the two sites will include engineered controls to limit the potential for human contact with waste and contaminated subsurface soil. Because contaminated waste and contaminated subsurface soils will be left in place on the DoD property under the selected alternatives for each site, LUCs are necessary to ensure the reliability of use assumptions. Appropriate procedures will be put in place to ensure the LUCs will be maintained to be protective of human health and the environment.

This DD presents the selected alternatives for CSA 3 and Landfill 5 sites at the DoD OU of Fort Sheridan, Illinois. The remedies have been developed in accordance with CERCLA, as amended, and are consistent with the NCP. The decision is based on the administrative record for the DoD OU of Fort Sheridan.

Name Date
Glynn Ryan, Chief, BRAC AFO
Fort Sheridan, Illinois
U.S Department of Army

Name Date
Robert R. Derrick, Colonel, GS
Chief, Base Realignment and Closure Division
U.S Department of Army

Name Date
Michael W. Beasley, Commander
88th Regional Readiness Command
U.S. Army Reserve

Name Date
Renee Cipriano, Director
Illinois Environmental Protection Agency

2.0 THE DECISION SUMMARY

This decision summary provides an overview of site characteristics, alternatives evaluated for CSA 3 and Landfill 5, and the analysis of those alternatives. It also identifies the selected remedies for CSA 3 and Landfill 5 and explains how the remedies fulfill statutory and regulatory requirements.

2.1 SITE NAME, LOCATION, AND BRIEF DESCRIPTION

2.1.1 Name and Location

Fort Sheridan, EPA ID IL2210020838, is located in Lake County, Illinois, along the western shore of Lake Michigan approximately 25 miles north of Chicago, Illinois, and 18 miles south of the Wisconsin state line. The facility is bounded by the City of Lake Forest to the north, the City of Highland Park to the south, and the City of Highwood to the west.

2.1.2 Lead and Support Agencies

The U.S. Army is the lead agency for the investigation and cleanup of Fort Sheridan. The U.S. EPA and Illinois Environmental Protection Agency (Illinois EPA) are the regulatory support agencies, as defined by the NCP. The U.S. Army is providing the cleanup funding for this site.

2.1.3 Site Type and Description

Fort Sheridan was established in 1887 to maintain civil order following the Great Chicago Fire in 1871 and labor riots in the city in 1886. The Fort subsequently operated as a training post for troops serving in the Spanish-American War, the Mexican Intervention of 1913, World War I, and World War II. The overall facility comprises 712 acres, including transferred surplus property (406 acres), property owned by the Navy (206 acres), and property owned by the Army Reserve (100 acres). The three residential and commercial communities surrounding the facility have a combined population of approximately 54,000 people and a combined area of approximately 30 square miles.

2.1.3.1 Coal Storage Area 3

Former CSA 3 was located east-southeast of Buildings 43 and 44 on the west side of Bartlett Ravine and occupied 0.5 acre along Chapman Road. Coal was stockpiled for industrial heating in this open area. Until 1999, CSA 3 occupied land on both the Surplus OU and the DoD OU. In 1999, a removal action was conducted to mitigate risks posed by PAHs related to coal at the western Surplus OU portion of CSA 3 and part of the DoD OU portion of CSA 3 up to the crest of the ravine. At the conclusion of the removal action, the Army recommended, and Illinois EPA concurred with, the conclusions of a "No Further Response Action Decision Paper" for the Surplus OU portion of CSA 3. This property was subsequently transferred for redevelopment to the Town of Fort Sheridan and now contains three houses at the north end, a playground in the northwestern end, and a storm water retention basin in its central portion.

Historical maps of the area identify a short branch of Bartlett Ravine that extended northwest into CSA 3, straddling the Surplus OU and DoD OU. This branch had been filled with refuse, including paper, porcelain, and ash, from about 5 to 20 feet bgs.

During the removal action in 1999, much of the filled area was excavated to between 10 and 15 feet bgs and soil from the top 5 feet was disposed of off site; however, the volume of refuse on DoD property was too great for inclusion in the removal action and some of the refuse was returned to the excavation pit and covered with 5 feet of clean clay backfill.

2.1.3.2 Landfill 5

Landfill 5 is located in a north-south trending tributary of Bartlett Ravine through the area west of Building 378. It is located in a light industrial area surrounded by warehouse facilities and storage areas. Most of the site is covered by concrete and asphalt paving associated with buildings, parking areas, and roads. The landfill site is located in an area that is currently used for vehicle and equipment storage and shop activities. Figure 3 shows the Landfill 5 boundary.

Wastes encountered at the site include cinders and other burned material along with artifacts (for example, soft drink bottles) dating back to the early 1900s. Construction rubble reportedly was disposed of at this site during the mid-1960s. Records do not indicate disposal of hazardous wastes at the site.

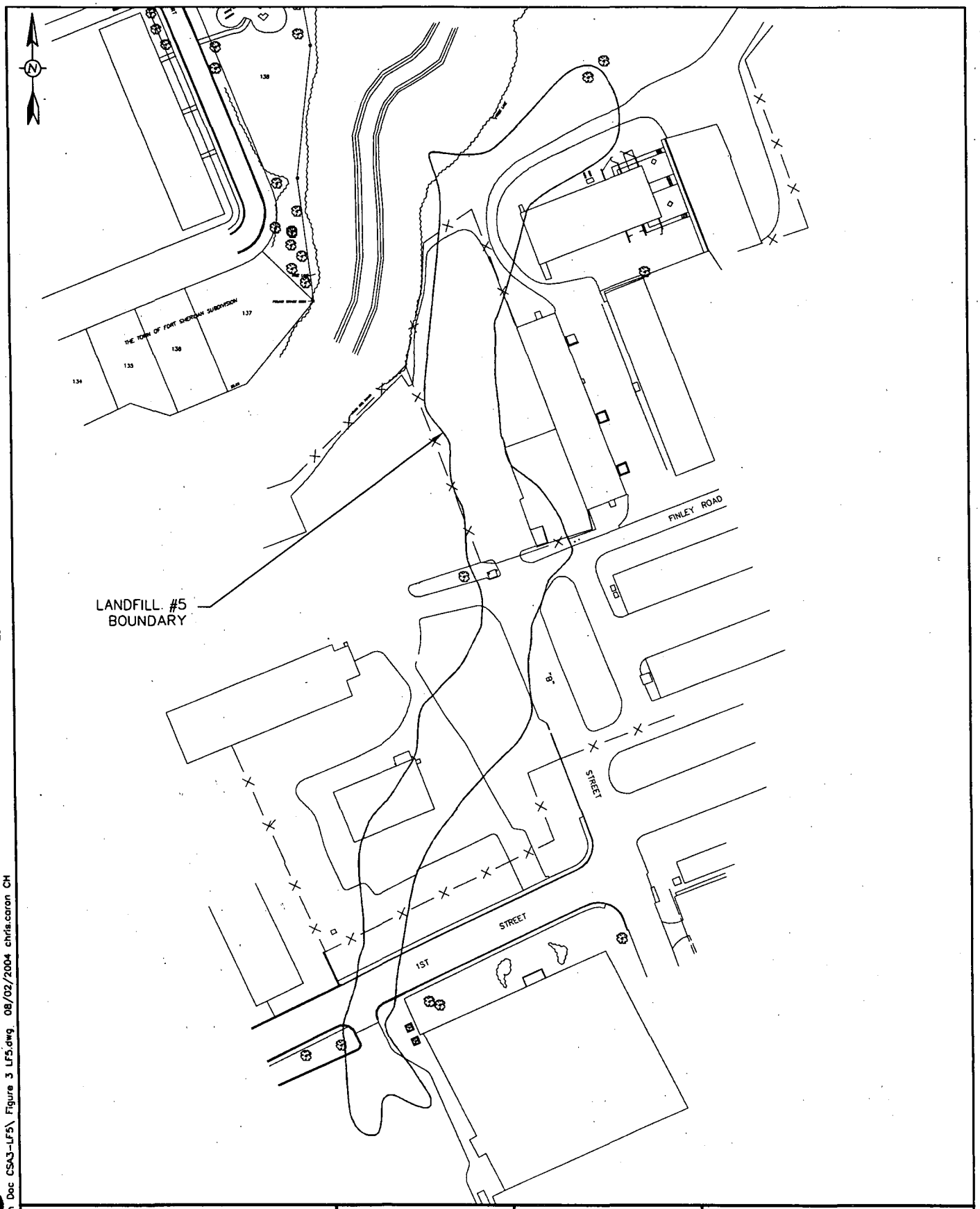
Numerous active sanitary and storm sewer lines intersect Landfill 5. A 14-inch-diameter force main intersects Landfill 5 in the northern portion of the site adjacent to Building 162. Two 6-inch sanitary sewer lines pass through the central and northern portion of Landfill 5 perpendicular to Buildings 378 and 162 respectively. Another 6-inch sanitary sewer line runs through the southern tip of the landfill near Building 139. In addition to the sanitary lines, two storm sewer lines (12- and 15-inch-diameter) pass through the central portion of the site adjacent to Building 378. A 24-inch-diameter storm sewer intersects the northern portion of Landfill 5 adjacent to Building 162 and a 12-inch-diameter storm sewer runs through the southern portion of the landfill near Buildings 149 and 122. The depth of these sanitary and storm sewer lines is estimated to range from 5 to 12 feet bgs. Other utilities including telephone, gas, water main, cable television, and numerous overhead lines intersect the landfill.

2.2 SITE HISTORY AND ENFORCEMENT ACTIVITIES

This section provides background information about Fort Sheridan and each OU, including activities that led to the current environmental conditions, site investigations, and removal actions conducted to date.

2.2.1 Facility History

Before military development of the land currently occupied by Fort Sheridan, the property was operated as a manufacturing center and lake shipping port between the 1840s and 1860s. The town of St. Johns was developed in the mid-1840s, with extensive ship piers and heavy industry including logging, lumbering, leather tanning, quarrying, brick-making, iron-casting, real estate development, and shipping enterprises. Commensurate with these activities, brickworks, sawmill structures, shipping infrastructure, factories, warehouses, and speculative real estate development were established on the property. Historical accounts indicate that extensive brickworks operations were established along the Lake Michigan bluff approximately 1,300 feet north of the present southern Fort boundary (approximately near Shenck Ravine) and that a lumber mill was operated near the location of the present historic district. The brickworks activity involved the quarrying of sufficient indigenous clay materials to produce in excess of 6 million bricks for building construction on the property. Extensive Fort acreage was harvested for oak trees that were in demand for framing houses and barns, building ships and wagons, for firewood, and other uses.



KEMRON Fort Sheridan Environmental Tetra Tech EM, Inc. Restoration Team	0 30 60 SCALE IN FEET	FIGURE 3	LANDFILL 5 BOUNDARY OF REMEDY DECISION DOCUMENT - LANDFILL 5 FORT SHERIDAN, ILLINOIS

G:\G\1135\Decision Doc CSA3-LF5\ Figure 3 LF5.dwg 08/02/2004 chris.caron CH

Bartlett Ravine Road was developed during this period of industrial development as an access route to an extensive pier on Lake Michigan that was used to ship products from the area. Real estate speculation resulted in the subdivision of approximately 90 acres of the property located between Wells Ravine and the southern Fort boundary for residential development that was not fully realized. The town of St. Johns operated until approximately 1865. The abandoned industry and development was suitable for military purposes.

The deed for the property that was to become Fort Sheridan was recorded on October 6, 1887, and the first troops arrived at the property (known as Camp Highwood) in November 1887. The site was officially renamed Fort Sheridan in February 1888, and the first permanent construction at the facility was initiated in 1889. The Fort operated between 1887 and 1993. It provided garrison and training facilities for Army troops participating in the Spanish-American War (1898), the Mexican Intervention of 1913, World War I (1917), and World War II (1940), and was established as a Nike missile launch site in the 1950s. Training activities in preparation for World War I included extensive construction of mock combat trenches over a large area of the southern portion of Fort Sheridan. Fort Sheridan also was the site of the largest World War I-vintage Army hospital (Lovell General Hospital) to treat wounded and convalescent soldiers. The hospital was closed in 1920, and Fort Sheridan became a military garrison between 1920 and 1940. Horses and Army mules played important roles in the training and daily activities on the Fort from the initiation of the facility until approximately 1940. Hundreds of horses of the 14th Cavalry and the 3rd Field Artillery continued to occupy the extensive stables on the Fort into the 1930s. Before and during World War II, Fort Sheridan was a center of anti-aircraft and coastal artillery training and served as a recruit reception center. Three artillery batteries were established along the shoreline of Lake Michigan. The Fort hospital was redesignated as a Regional Station Hospital and Rehabilitation Center and its facilities were expanded in 1945 to meet the increased post-war needs of returning troops.

Between the 1950s and 1974, Fort Sheridan functioned not only as a Nike missile launch area in the Chicago defense network, but also as a maintenance and service center for Nike operations for several Midwestern metropolitan areas. Between 1967 and 1993, operations at Fort Sheridan were primarily administrative, with the Fort serving alternately as headquarters for the Fifth Army, the Army Recruiting Command, and the Fourth Army, and providing administrative and logistical support to 74 Army Reserve centers in Midwestern states from Minnesota to Michigan.

In 1988, Fort Sheridan was recommended for closure by the BRAC Commission. Fort Sheridan ceased military operations as an Army facility in May 1993 and closed under the BRAC process. The southwest quadrant and the northwest corner (approximately 100 acres) of the Fort were realigned to the U.S. Army Reserve Command. In January 1994, the southeast quadrant and a small area on the central west side of Fort Sheridan (approximately 206 acres) were realigned to the Navy for use as housing and administrative offices. The combined Army Reserve and Navy properties, which are shown on Figure 1, have been designated as the DoD OU. The property that comprises the remainder of the installation, designated as the Surplus OU, primarily consists of the golf course and the historic district. All of the Surplus OU has been transferred to Lake County and the surrounding municipalities for redevelopment.

2.2.2 Environmental Investigations and Remedial Actions

Fort Sheridan has undergone numerous investigations for environmental contamination and remedial action. These investigations and remedial actions are discussed below.

Several investigations conducted between 1981 and 1989 identified areas on the DoD OU that potentially were affected by landfilling and site usage by the Army. It was recommended that the Army continue efforts to close Landfill 7, secure proper polychlorinated biphenyl (PCB) and pesticide storage areas, and test petroleum underground storage tanks (UST) for leakage. By 1987, deficiencies related to PCB and pesticide storage were resolved and the Army was working with the Illinois EPA to close former Landfill 7. It was concluded from available geologic evidence and information regarding potential chemical sources that chemicals were not migrating through shallow groundwater.

In addition, USTs on Fort Sheridan had not been leak-tested.

The Army completed an Enhanced Preliminary Assessment (PA) of Fort Sheridan. The PA was initiated by the Army after Fort Sheridan was required to close under the BRAC program. The objectives of the PA included identifying and characterizing all environmentally significant operations with respect to known or suspected chemical releases to the environment, identifying areas of concern that might require additional investigation, identifying other areas that might require immediate action, identifying other actions that might be necessary to address and resolve all identified environmental problems, and identifying other environmental concerns that might present impediments to the expeditious transfer of the property. The Army concluded that Fort Sheridan did not present any imminent or substantial threat to human health or the environment; however, additional investigations were recommended to fully characterize the environmental impacts of on-site landfills and Buildings 139, 368, and 377 on the DoD OU.

The Environmental Photographic Interpretation Center (EPIC) of the U.S. EPA, under contract to the U.S. Army Environmental Center (USAEC), compiled and analyzed historical aerial photographs of Fort Sheridan taken between 1952 and 1985. The EPIC photographs document Fort activities and provide an archive of information regarding the evolving land usage on the Fort during this time period. The boundaries for study areas on the DoD OU initially were established using the EPIC photographic interpretations. Activities on the DoD OU that are clearly documented on the photographs include landfilling activities at Landfills 1, 6 and 7; vehicle equipment storage (VES) areas; and former coal storage pile locations.

The Army initiated a facility-wide RI at Fort Sheridan in 1990 that included study areas located within the Surplus and DoD OUs. The draft final RI report included recommendations for further investigations to characterize the various study areas and to support a baseline risk assessment (BRA) and FS for Fort Sheridan. These recommendations, as well as data gaps identified by subsequent reviews of the report and supplemental historical information, indicated the need for a second phase of data collection and analysis. The results of asbestos and electrical transformer surveys conducted concurrent with the RI were reported in separate documents.

Recent environmental studies at Fort Sheridan that include portions of the DoD OU include a background sampling and analysis program to establish the existing analytical database for background soil, sediment, surface water, and groundwater. The background sampling and analysis program was designed to characterize the background environmental conditions for comparative purposes with soil, sediment, surface water, and groundwater data from the investigated study areas. Specifically, soil and groundwater samples were collected from four areas believed to be unaffected by mission-related activities: one on each of the north, south, east, and west boundaries of Fort Sheridan. Background surface water and sediment samples were obtained off the Fort from a Janes Ravine tributary located north of Fort Sheridan.

Because of regulatory concerns arising from potential health risks that are associated primarily with Landfill 7, interim remedial actions have been undertaken at Landfills 6 and 7. Problems that have been associated with Landfill 7 in the past included leachate seeps from the landfill slopes, leachate discharges to storm sewers, and landfill gas odors and emissions. Regrading of a portion of Landfill 7 to mitigate landfill seepage near the Navy housing area was completed in 1995. A focused feasibility study (FFS) was completed to evaluate potential interim remedial action alternatives at the landfills. The alternatives that were evaluated in detail in the FS included no action, emplacement of a Resource Conservation and Recovery Act (RCRA) cap, emplacement of a modified RCRA cap, and waste excavation with off-site disposal. A proposed plan for the interim remedial action that identified a preferred alternative was prepared by the Army in 1996.

The preferred alternative for Landfills 6 and 7 consisted of a combination of the capping alternatives and included a RCRA cover for the upper portion of Landfill 7 and the entirety of Landfill 6, with a modified RCRA cover on the east slope of Landfill 7. A formal public review and comment period was held for the proposed plan between August and September 1996.

The approved DD for the selected interim source control action at Landfills 6 and 7 was finalized in April 1997. In addition to the previously identified capping alternative, the selected remedy provided for leachate collection and treatment, installation of a new storm drain around the perimeter of the landfills with decommissioning of the old storm sewer beneath the landfills, installation of an active landfill gas collection and treatment system, and LUCs to protect the cap and the installed remediation systems.

The Army continued the RI and BRA on the DoD OU of Fort Sheridan. In 1995, RI activities were conducted at 40 study areas, including 23 sites identified during the Phase I RI and 17 additional areas recommended for investigation. The objectives of the RI were to investigate and confirm the presence, nature, and extent of mission-related chemical constituents that potentially impact environmental media. These chemical constituents result from the historical training, light industrial, and landfilling activities conducted on the DoD OU since the late 1880s. The investigations included assessments of the sources of potential mission-related constituents, delineation of the areal extent of detected constituents, geologic and hydrogeologic characterization of the study areas, and assessment of potential ecological and human health risks associated with identified chemical constituents.

In 2000, the Army conducted Phase III investigations associated with the RI and BRA for the DoD OU of Fort Sheridan. These additional studies were conducted to supplement information obtained during the Phase I and II RIs, incorporate sampling conducted during interim remedial actions (at Landfills 6 and 7) and removal actions (at CSA 3) on the property, and further investigate ravine extensions and study areas that were not characterized fully during the earlier RI phases. The Phase III RI further evaluated ecological risks associated with detected chemical constituents in the natural ravines and beach areas on the DoD property. The Phase II study areas that were evaluated during the Phase III RI were Landfill 5, Wells Ravine Western Extension (investigated in conjunction with Landfill 6 during Phase II), Bartlett Ravine, Van Horne Ravine, Shenck Ravine, Building 70, and Excavation Area 8. Additional areas evaluated during the Phase III RI that were not investigated during Phase II activities were the Wells Ravine Northern Tributary, Beach Pistol/Machine Gun Range, and CSA 3 DoD extension. CSA 3, Landfill 5, and Building 70 were carried forward from the Phase II and III RI to the FS stage because all other areas were determined to require no remedial action.

2.3 ENFORCEMENT ACTIVITIES

No enforcement actions pertaining to CSA 3 or Landfill 5 are pending at Fort Sheridan and none have been taken in the past.

2.4 COMMUNITY PARTICIPATION

The proposed plan (PP) for CSA 3 and Landfill 5 was made available to the public 20 February 2003. It can be found in the administrative record file maintained at Fort Sheridan and the information repository maintained at the Highwood Public Library. The notice of the availability of the PP was published in the Pioneer Press on 20 February 2003. A public comment period was held from 20 February 2003 to 20 March 2003. During this period, an extension to the public comment period was requested. As a result, the public comment period was extended to 20 April 2003. In addition, a public meeting to present the PP was held on 20 February 2003. Restoration Advisory Board (RAB) meetings were held on 26 February 2003 and 15 April 2003.

At these three meetings, representatives of the U.S. Army, U.S. EPA, and Illinois EPA answered questions about problems at the site, future land use issues, and the remedial alternatives.

The Army's response to comments received during this period is included in the Responsiveness Summary, which is part of this DD (see Appendix B).

In addition to community involvement during the proposed plan process, the U.S. Army has conducted many activities to keep residents informed of ongoing environmental cleanup activities at Fort Sheridan, involve them in decision-making processes, and identify and address their questions and concerns.

For example, community interviews were conducted and community involvement plans or assessments were developed in 1994, 1995, 1999, and most recently in early 2002. A quarterly newsletter is distributed to local residents, and additional fact sheets and announcements about site activities have also been distributed. Residents are also notified in advance of all RAB meetings, which occur approximately every 2 or 3 months. Since 2002, information has also been made available on-line to residents via a project website.

2.5 SCOPE AND ROLE OF OPERABLE UNIT OR RESPONSE ACTION

Fort Sheridan ceased military operations as an Army facility in May 1993 and closed under the BRAC process. The southwest quadrant and the northwest corner (approximately 100 acres) of Fort Sheridan were realigned to the U.S. Army Reserve Command. In January 1994, the southeast quadrant and a small area on the central west side of Fort Sheridan (approximately 206 acres) were realigned to the Navy for use as housing and administrative offices. The combined Army Reserve and Navy properties are designated as the DoD OU. There are no plans by the Navy or the Army Reserve to transfer their respective portions of the DoD OU out of DoD ownership. Current efforts at the DoD OU consist of eight areas: Landfills 6 and 7, VES 8, CSA 3, CSA 4, Water Tower Soil, Building 70, Landfill 5, and Landfill 1. The property that comprises the remainder of the installation, designated as the Surplus OU, consists of the golf course and the historic district. All of the Surplus OU has been transferred to Lake County and the surrounding municipalities for reuse as open space, golf course, and residential housing. Prior to transfer, two landfills were closed and all known underground storage tanks were removed.

This DD selects the final, comprehensive remedial action for the waste and contaminated subsurface soil at two sites, CSA 3 and Landfill 5. The remedies have been and will be conducted in accordance with CERCLA and the NCP. This is the third DD for the DoD OU. A DD for interim source control at Landfills 6 and 7 was signed on 22 April 1997. A DD for the No Action Sites was signed in June 2002. On 7 May, 2002, the Army signed an Action Memorandum outlining cleanup of four sites in the DoD OU: (1) VES 8; (2) CSA 4; (3) soil at the Water Tower; and (4) Building 70. Landfills 6 and 7 are being capped as part of the final phase of an interim remedial action. Final action for Landfills 6 and 7 as well as Landfill 1 will be addressed in subsequent separate proposed plans and DDs.

This DD is consistent with the master plan and cleanup goals for the DoD OU of Fort Sheridan, and the LUC components of the remedy will become part of the master plan for the installation. Current efforts at the DoD OU consist of four areas: Landfills 6 and 7, CSA 3, Landfill 5, and Landfill 1.

Past response activities for the DoD OU include:

- Capping Landfills 6 and 7
- Soil Removal and restoration at VES 8, CSA 4, the Water Tower, and Building 70

Activities proposed in this DD include the following:

- Erosion controls and limited excavation at CSA 3
- Covering excavated areas with 2 feet of compacted clay and 2 feet of topsoil and revegetating with small trees or bushes to maintain a consistent 4-foot cover of clean soil over any remaining refuse at CSA 3
- Site preparation and cover installation at Landfill 5
- Erosion controls for the ravine slope of the Landfill 5
- LUCs for both CSA 3 and Landfill 5

Future response plans for the DoD OU are as follows:

- Cleanup options for Landfill 1 are currently being evaluated
- Final action for Landfills 6 and 7 will be determined subsequent to implementation of ongoing interim actions.
- As described in Section 1.4.1, Army policy precludes signing a LUCMOA for Fort Sheridan. Nevertheless, the Army intends to append the agreed-upon LUC language to the design documents and to implement, monitor, and enforce the LUCs as described.

2.6 SITE CHARACTERISTICS

This section provides a comprehensive overview of Fort Sheridan, including natural, historic, and archeological resources, and geology and hydrogeology of Fort Sheridan.

In addition, it provides an overview of the probable sources and extent of contaminants detected in samples from the waste and contaminated subsurface soil at Fort Sheridan.

The site map in Section 1 of this document shows the location of CSA 3 and Landfill 5 and their position in relation to surrounding buildings and roads. The buildings in the immediate vicinity of the sites are on DoD property and used for military purposes. The roads are used by base personnel and residents of the Town of Fort Sheridan to enter and exit the property. CSA 3 was used to stockpile coal for heating purposes. Excavation during a previous removal action at CSA 3 revealed the presence of refuse including porcelain plates, metal horseshoes, bricks, bottles, and fine ash. Excavation at Landfill 5 uncovered cinders and other burned material, household artifacts, and construction rubble. There are no records documenting disposal of hazardous waste at the site.

The COCs at both sites are found in the soil. For CSA 3, COCs are PAHs detected at concentrations from 0.072 to 6.8 µg/g at a depth of less than or equal to 1 foot bgs. At a depth of 1 to 10 feet bgs, the COCs are PAHs at concentrations from 0.00004 to 21.2 µg/g. At a depth greater than 10 feet bgs COCs are PAHs at concentrations from 0.00023 to 0.00055 µg/g.

Landfill 5 COCs at a depth of less than or equal to 1 foot bgs are PAHs at concentrations from 0.007 to 100 µg/g and lead at concentrations of 2.48 to 1,400 µg/g. Landfill 5 COCs at a depth of 1 to 10 feet bgs are PAHs at concentrations from 0.0052 to 70 µg/g and lead at concentrations of 6.4 to 2,600 µg/g. Finally, Landfill 5 COCs at a depth of greater than 10 feet bgs are PAHs at concentrations from 0.02 to 10 µg/g and lead at concentrations of 0.99 to 3,600 µg/g.

The FS estimates that the volume of soil and waste to be addressed in this action is 1,250 cubic yards at CSA 3 and 98,862 cubic yards at Landfill 5. Potential exposure pathways at both sites are dermal, inhalation, and ingestion, and the populations that could be affected are maintenance workers, industrial workers, construction workers, and intruders. Future residential or recreational use is not planned for these sites.

2.6.1 Size of the Site

Fort Sheridan is approximately 712 acres. The DoD OU of Fort Sheridan is approximately 306 acres. CSA 3 and Landfill 5 comprise approximately 0.5 and 3 acres respectively.

2.6.2 Geographical and Topographical Information

Surface topography at Fort Sheridan is relatively flat, with a gentle 2- to 4-degree slope to the east that terminates in a bluff embankment along the shore of Lake Michigan. The top of the bluff ranges from 39 to 69 feet above the Lake Michigan water level and extends the full length of the Fort boundary with the lake. Regularly spaced groins have been placed along the shore of Lake Michigan (including the Fort Sheridan shoreline) to inhibit beach erosion and potential bluff destabilization. The beach at the foot of the bluff is approximately 20 to 50 feet wide and consists of coarse sand with boulder-sized rip-rap material at the base of the bluff. An aerial survey of Fort Sheridan was completed in March 1996, and a topographic map of the installation was prepared as part of the RI.

Ground surface elevations at Fort Sheridan range from approximately 650 feet above mean sea level (msl) at the top of the bluff line to 695 feet above msl at the western boundary of the installation. The installation is traversed from east to west by six ravines (Janes Ravine, Hutchinson Ravine, Bartlett Ravine, Van Horne Ravine, former Wells Ravine, and Shenck Ravine) that generally are oriented perpendicular to the lake shoreline.

The ravines south of Bartlett Ravine are in the DoD OU with the north edge of Bartlett Ravine comprising a general boundary between the OUs on Fort Sheridan. Several of the ravines in the DoD OU or their tributaries have been used as landfill sites, including Wells Ravine (Landfills 6 and 7), a tributary to Bartlett Ravine (Landfill 5), and a tributary to Janes Ravine (Landfill 1). Aerial photographs and historical maps show that Van Horne and Shenck Ravines extended farther west than their present terminations at or near Patten Road, indicating that headward portions of these ravines have been infilled.

Bartlett Ravine is asphalt-paved along its entire length down to the Lake Michigan shoreline, with surface water drainage culverts along both sides of the roadway. The Lake Michigan bluff and unfilled ravine areas are moderately to densely vegetated.

Fort Sheridan is bounded to the east by Lake Michigan, with an average water surface elevation of approximately 579 feet above msl. Isopach maps prepared from bathymetric data between 1910 and 1974 indicate that the nearshore lake zone adjacent to Fort Sheridan represents a zone of net erosion. The Low Water Datum for Lake Michigan is 576.8 feet above the International Great Lakes Datum (IGLD) at Father Point, Quebec. The lake level fluctuates approximately 1 foot annually with a high in the early summer and a low in mid-winter. Seasonal cycles typically do not impose adverse effects on the shoreline; however, wave energy is dissipated at more shoreward locations during multiyear periods of lake level rise. The effects of higher lake levels cause a shoreward displacement of the shoreline that allows waves to act at higher levels on the shore. The Skokie River and the North Branch of the Chicago River flow to the west of the installation parallel to the Lake Michigan shoreline.

2.6.3 Areas of Archeological or Historical Importance

In 1984, approximately 230 acres of Fort Sheridan property were designated a National Historic Landmark and listed on the National Register of Historic Places. These 230 acres are located on the Surplus OU. Contributing structures are detailed in a report entitled "Literature Review, Architectural Evaluation and Phase I Archaeological Reconnaissance of Selected Portions of Fort Sheridan, Illinois" (September 1993). The Historic District encompasses land and buildings bounded by Hutchinson and Bartlett Ravines along the shores of Lake Michigan in Lake County, Illinois.

Ninety-two structures are included within the Historic District. These buildings were constructed between 1889 and 1908. This property was transferred to Lake County and the surrounding communities. No structures on the DoD OU of Fort Sheridan have been designated as historic landmarks.

2.6.4 Sampling Strategy

2.6.4.1 Coal Storage Area 3

In 1999, CSA 3 underwent a removal action to mitigate risks posed by coal-related PAHs. The removal action extended onto the DoD OU up to the crest of Bartlett Ravine. Confirmation soil samples collected during the removal action were included in the site characterization analysis to further define the extent of contamination on the DoD OU portion of CSA 3.

In 2000, a Phase III RI was conducted at CSA 3 to further define the extent of potential contamination on the DoD OU property. The investigation focused on a former small three-pronged tributary of Bartlett Ravine in the northern portion of the study area. The analytical results from that investigation have been included in the site characterization analysis.

The DoD OU property that is located between the northern edge of the Bartlett Ravine and the DoD OU property line to the north was investigated during the Phase III RI by excavating and sampling three test pits perpendicular to areas of suspected ravine tributary fill. The test pits were located in the field subject to locations of buried utilities and surface construction. Soil samples were collected from two borings at 0, 2, and 6 feet bgs.

At one test pit, soil samples were collected from 0, 1, 2, and 5 feet bgs. All of the test pit soil samples were analyzed for volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), metals, pesticides, PCBs, and explosives.

Three soil borings were drilled to delineate the limits of the waste at CSA 3. No samples were collected from these soil borings for chemical analysis. No groundwater samples were collected during the Phase III investigation because the groundwater pathway was previously determined to be incomplete.

Numerous chemicals were detected in the test pit soil samples at CSA 3 during the Phase III RI, including metals, SVOCs (predominantly PAHs), PCBs, pesticides, and explosives.

During the Phase III RI, two test pits encountered predominantly clayey silt fill overlying clayey till. One test pit encountered a zone of black silt with ash, cinders, slag, nails, and horseshoes between 5 and 25 feet from the southern end of the test pit to 4 feet bgs. The refuse layer indicates the presence of fill material in the middle ravine tributary. The test pit encountered silty clay fill to approximately 9 feet bgs in its northern extension (into the middle ravine lobe), which may have been backfill associated with the removal action. The refuse material was not observed in the eastern wall (closest to Bartlett Ravine). A concrete slab was also encountered.

Geoprobe borings were drilled in the northern ravine arm on the DoD property at CSA 3 to investigate further potential fill areas as delineated during the removal action of CSA 3 and to obtain additional information south of the southernmost ravine tributary. A boring was drilled to 16 feet bgs and encountered predominantly clay soil to completion depth.

2.6.4.2 Landfill 5

Environmental samples were collected at Landfill 5 during three separate RI activities (Phases I, II, and III) to determine the extent of potential contamination.

In addition, monitoring wells were established and groundwater samples were collected to characterize the extent of potential groundwater contamination at the Landfill 5 study area. To further define waste and contaminated subsurface soil conditions in the southern portion of Landfill 5, samples associated with Building 378 (Acid Pit), Building 143 (former chemical mixing area), and Building 122 (former hazardous material/waste storage area) were included in the site characterization analysis.

The RI results for Landfill 5 indicated that soil and waste within the landfill are contaminated with lead and PAHs. Overall, the concentration and number of detected compounds in contaminated waste and subsurface soil decreased with depth within the fill materials and was markedly lower in the undisturbed glacial soil. Analysis of the undisturbed glacial soils, subsurface glacial soils underlying fill or waste materials at Landfill 5 did not indicate significant organic constituents below the waste materials. The depth and quantity of waste and debris within the landfill decrease along the southern direction of the former tributary. There are no discernable trends in the constituent concentrations detected in groundwater or leachate collected at Landfill 5. There is no definitive evidence that the waste in Landfill 5 is contributing to the degradation of the surrounding groundwater.

2.7 CURRENT AND POTENTIAL FUTURE LAND AND WATER USES

2.7.1 Land Uses

Land use adjacent to Fort Sheridan is both commercial and residential, with residential properties accounting for the largest land use activity. Fort Sheridan is bordered by the cities of Highwood to the west, Highland Park to the south, and Lake Forest to the north. The urban center for the City of Highwood, population 5,331, lies immediately adjacent to the southwest corner of the Fort. Highwood encompasses 0.6 square mile with a town center that consists of small shops and restaurants. Residential housing and a school are located adjacent to the center of Highwood. Highland Park, population 30,575, covers 12.5 square miles with commercial activities also consisting of small businesses and restaurants. The City of Lake Forest, population 18,477, is located north of the Fort Lake Forest and covers 17.1 square miles, with commercial activities also consisting of small businesses and restaurants.

Fort Sheridan encompasses 712 acres along the Lake Michigan shore. Approximately 100 acres of the property are owned by the Army Reserve and are used for equipment storage and disbursement, training, and administrative functions. The Navy owns approximately 206 acres, consisting predominantly of 195 acres of the southeast quarter of the Fort, including Bartlett Ravine and an 11-acre parcel on the western boundary of the Fort between Sheridan and Westover Roads. These areas are used primarily for military family housing. The remaining property (approximately 400 acres) has been declared excess by the Army and has been transferred to the local communities.

Approximately 425 structures are located on the DoD OU of Fort Sheridan, including administrative offices, maintenance and storage buildings, housing units, a fire station, and a clinic. Of these 425 structures, 329 housing units are located on the Navy-owned property. The 425 structures have a combined area of approximately 2,874,500 square feet.

Non-housing structures on the DoD OU are used for administrative purposes, warehouse storage, equipment maintenance, open storage, and Army and Marine Corps Reserve activities. The U.S. Navy maintains 329 single- and multiple-person housing units on the DoD OU. Housing units on the DoD OU include single-family and duplex residences on Boles Loop and duplex housing on Westover Road. All other housing units on the DoD OU are multifamily and are occupied by U.S. military personnel and families. Approximately 40 structures on the Navy property are scheduled for demolition.

Just before its closure, Fort Sheridan employed 4,525 military personnel and 1,650 civilian personnel. U.S. Census data for 1990, before closure, indicated a resident population on the Fort of 2,405 persons. Demographic information provided by the Navy indicates that 1,172 persons reside in Navy housing on Fort Sheridan, with an additional nonresident, 256-person worker population and a 380-person Marine Corps reservist population associated with Marine Air Control Group 48. Open areas on the former Fort Sheridan include an 18-hole golf course, unfilled ravine areas, a cemetery, VES areas, the Lake Michigan bluff and beach area, the landfilled Wells Ravine, and approximately 10 miles of paved and unpaved road.

There are no plans to transfer CSA 3 or Landfill 5. Current land use for these areas is Industrial/Commercial. There are no zoning plans, zoning maps, or master plans indicating a different future use. Future land use for the sites is to continue their industrial/commercial use.

2.7.2 Groundwater and Surface Water Uses

Lake Michigan, which provides approximately 97 percent of the water used in the Chicago area, is also Fort Sheridan's source of potable water. The water treatment plant for Fort Sheridan, which was used until the base closed in 1993, is positioned on the lakeshore, with the water intake pipe extending 0.7 mile into the lake from the water plant (Building 29). Water currently is provided to the DoD OU by the City of Highland Park.

Information regarding the distribution of water supply wells and privately owned wells in the vicinity of Fort Sheridan was obtained from the *Final Groundwater Classification Document.* Water well records that were incorporated in the document were from the Illinois State Geological Survey (ISGS) and the Illinois State Water Survey (ISWS) for section 3, 4, 9, 10, 11, 14, 15, 16, 22, 23, and 24 of Range 12E and Township 43N in Lake County, Illinois. A 1-mile radius from the Fort boundary includes portions of Highwood and Highland Park extending approximately to State Highway 41 (Skokie Highway) to the west and south and also includes a portion of Lake Forest to the north.

Illinois surveys identified thirty-eight unique wells within a 2-mile radius of Fort Sheridan with 6 of the 38 wells located within a 0.5 mile radius of Fort Sheridan.

The wells range in depth from 20 to 1,753 feet bgs and produce groundwater from bedrock and deep glacial aquifers. Six of the wells have documented usage as domestic water supplies. Four of the domestic wells are beyond a 1-mile radius from the Fort boundary and two of the wells have indeterminate locations based on the available records. The remaining wells are composed of monitoring wells, a park well, industrial and commercial wells, a state-owned well, and several wells with unspecified usage in the state records.

There are no perennial streams on the DoD OU. Surface water runoff flows into either the nearest ravine or the base stormwater system and ultimately discharges into Lake Michigan. Intermittent bodies of surface water are not used for recreation, irrigation, or household purposes. There are no future plans to use groundwater or surface water on the site or in its vicinity outside of those uses described in this section.

2.8 SUMMARY OF SITE RISKS

2.8.1 Human Health Risks

A human health BRA was conducted to assess the potential for adverse health effects associated with exposure to chemical constituents detected in soil samples collected from the eight study areas within the DoD OU evaluated in the FS. In addition to the current land use scenario, hypothetical exposures were evaluated for potential future land use scenarios.

The current land use scenario includes recreational visitors (adolescent) to the study areas or portions of the study areas that are not surrounded by fences, intruders (adolescent) on the study areas or portions of the study areas that are surrounded by fences, and maintenance workers (adult) at all of the study areas. Under the current land use scenario, only limited potential for exposure exists at this time, particularly for the recreational land use scenario, and residential exposures were not evaluated because residents do not live within the boundaries of any of the DoD OU study areas. In addition, routine maintenance work at many of the study areas is limited or nonexistent.

The master plan for the DoD OU of Fort Sheridan does not include plans for the transfer of CSA 3 or Landfill 5. Because the future of private or public development of the DoD OU was unknown at the time the FS was completed, several different potential future land use scenarios were evaluated, based on the assumption that existing LUCs (such as fences) would be removed and remedial actions would not take place. The potentially exposed receptors evaluated include an industrial worker (adult), construction worker (adult), resident (child and adult), and recreational visitor (child and adult).

Most PAHs do not have published reference doses (RfD) for noncancer effects, and only benzo(a)pyrene has a published slope for cancer effects. The evaluation of lead is conducted by first comparing the exposure point concentration for each exposure unit to the action level of 400 mg/kg in soil, according to the U.S. EPA guideline. For CSA 3 and Landfill 5, chemical cancer risks and HQs were estimated based on EPA guidance. Carcinogenic risks and noncarcinogenic hazards were summarized across exposure routes and media for each receptor. Totals for each medium were summed to obtain a total risk value that includes all reasonable pathways for each receptor.

The RI results indicate that PAH contamination remains in the DoD OU portion of the CSA 3 site at depths of up to 10 feet bgs. The human health risk assessment (HHRA) conducted as part of the RI indicates that risks for the current land use scenarios for CSA 3 do not exceed U.S. EPA's standards for public health protection; however, subsurface levels of PAHs may present risk to future residential, industrial, and recreational land users through direct contact with or ingestion of PAHs if the receptors are exposed to landfill waste material. This potential risk can be expressed as 8×10^{-4}, or eight additional chances in ten thousand of developing cancer as a result of lifetime exposure. This area for potential exposure is confined to DoD property along the edge of the ravine and two areas at the northern end of CSA 3 where test pits excavated during the RI identified the presence of PAH contamination from the surface to about 2 feet bgs in portions of two cells. Additional refuse that was not removed during the 1999 removal action was found in portions of these cells.

RI results indicate that waste and contaminated subsurface soil within Landfill 5 is contaminated with PAHs and lead from the surface to about 22 feet bgs. The HHRA indicates that risks for the current land use scenarios achieve U.S. EPA standards for public health protection; however, levels of PAHs and lead may present risk to future residential and recreational land users through direct contact with or ingestion of the substances if they are exposed. This potential risk can be expressed as 1×10^{-4}, or one additional chance in ten thousand of developing cancer as a result of lifetime exposure. The maximum concentration of lead detected at Landfill 5 was 540 mg/kg in the subsurface soil and 3,600 mg/kg in the landfill waste. The RI found no evidence that the waste in Landfill 5 is contributing any contaminants to the underlying groundwater.

Results of groundwater sampling at CSA 3 and Landfill 5 showed that no COCs were found at concentrations above background levels outside of the waste areas. In addition, no discernable contamination contributions from either CSA 3 or Landfill 5 to the groundwater were detected. As a result, the groundwater migration pathway was dropped from further evaluation.

Table 1 identifies the significant COCs and the minimum and maximum concentrations in soil found at CSA 3 and Landfill 5. Table 2 identifies excess lifetime cancer risk (ELCR) values for the current and future health risk scenarios for CSA 3 and Landfill 5.

TABLE 1
CHEMICALS OF CONCERN IN WASTE AND SOIL
CSA 3 AND LANDFILL 5
FORT SHERIDAN, ILLINOIS

Chemical of Concern	CSA 3			Landfill 5		
	Concentration Detected (µg/g)		Frequency of Detection	Concentration Detected (µg/g)		Frequency of Detection
	Minimum	Maximum		Minimum	Maximum	
Benzo(a)anthracene	0.0002	21.2	56/81	NA	NA	NA
Benzo(a)pyrene	0.00006	19.1	55/81	0.02	80.0	69/131
Benzo(b)fluoranthene	0.001	15.6	59/81	0.0056	100.0	71/131
Benzo(k)fluoranthene	0.00004	8.82	59/81	NA	NA	NA
Chrysene	0.00028	6.8	10/16	NA	NA	NA
Dibenzo(a,h)anthracene	0.004	4.48	38/81	NA	NA	NA
Indeno(1,2,3-cd)pyrene	0.00021	20.2	57/81	NA	NA	NA
Lead	NA	NA	NA	0.99	3,600	129/138

Notes:

CSA = Coal storage area
µg/g = Microgram per gram
NA = Not applicable

This table presents the chemicals of concern (COC) detected in the soil at CSA 3 and Landfill 5. Samples were collected at three depths: less than 1 foot below ground surface (bgs), 1 to 10 feet bgs, and greater than 10 feet bgs. The minimum and maximum values are from the combined samples for each COC at each depth at each site. The maximum values for COCs at CSA 3 decreased with depth, and the maximum values for COCs at Landfill 5 increased with depth. These findings support the decision to place a cover over Landfill 5 and conduct targeted excavation at CSA 3.

TABLE 2
CURRENT AND FUTURE POTENTIAL HEALTH RISK SCENARIOS
CSA 3 AND LANDFILL 5
FORT SHERIDAN, ILLINOIS

Location	Current Land Use			Future Land Use		
	Residential	Industrial/Commercial	Recreational	Residential	Industrial/Commercial	Recreational
CSA3	NA	3×10^{-6}	9×10^{-6}	$8 \times 10^{-4(a)}$	$4 \times 10^{-4(a)}$	$4 \times 10^{-4(a)}$
Landfill 5	NA	$2 \times 10^{-7(b)}$	1×10^{-6}	$4 \times 10^{-4(a)}$	6×10^{-5}	$2 \times 10^{-4(a)}$

Notes:

CSA3 = Coal Storage Area 3
(a) = This level of risk only occurs when in direct contact with landfill waste (subsurface soil).
(b) = This level of risk would be expected for a maintenance worker.

2.8.2 Ecological Risks

A baseline ecological risk assessment (BERA) was conducted for the Fort Sheridan DoD OU to evaluate potential adverse ecological effects that may occur or are occurring as a result of exposure to chemical constituents detected at the DoD OU study areas. Of the eight FS study areas, only three (Landfills 1, 6 and 7) contain constituents in surface soil at concentrations that pose potentially unacceptable risks to ecological receptors. Landfills 6 and 7 have now been capped as a result of an interim remedial action selected in 1997.

A baseline ecological risk assessment conducted for the Fort Sheridan DoD OU concluded that surface soil at CSA 3 and Landfill 5 poses no potential unacceptable risks to ecological receptors. There is a potential for unacceptable risk to ecological receptors if subsurface contamination becomes exposed in the future through slope failure or unchecked erosion on the ravine slopes.

2.9 BASIS FOR TAKING ACTION

The response action selected in this DD is necessary to protect the public health or welfare and the environment from actual or threatened releases of hazardous substances into the environment.

2.10 REMEDIAL ACTION OBJECTIVES

The remedial action objectives (RAO) for CSA 3 and Landfill 5 at the DoD OU of Fort Sheridan specify the requirements that the remedial action alternatives must fulfill to protect human health and the environment from the COCs identified in waste at CSA 3 and Landfill 5. The RAO for protecting human receptors considers both the constituent concentrations and the exposure route because protectiveness may be achieved by reducing exposure as well as by reducing constituent concentrations. The RAO also ensures that the planned remedial alternative does not affect the local environment significantly because the use of heavy equipment can damage sensitive ecosystems.

As defined by the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), acceptable exposure levels to known or suspected carcinogens are generally concentration levels that represent an excess lifetime cancer risk to an individual between 1×10^{-4} and 1×10^{-6}, based on a dose-response relationship. These levels are considered generally acceptable for industrial workers under an industrial land use scenario only. The point of departure is 1×10^{-6}, and risk below that level can be interpreted as unconditionally acceptable for any future industrial or residential land use. The final RAO for CSA3 and Landfill 5 is a human health risk value of 1×10^{-6}, but the final residual risk level may be within the risk management range of 1×10^{-6} to 1×10^{-4}, or less than 1×10^{-6}. .

The RAOs for CSA 3 and Landfill 5 are as follows:

CSA 3

- Prevent the exposure of future residents, recreational visitors, or industrial and commercial workers from contact with PAHs through direct contact with or ingestion of waste and subsurface soil that would result in an ELCR of 1×10^{-4} or more.

Landfill 5

- Prevent the exposure of future residents, recreational visitors, or industrial and commercial workers to PAHs and lead through direct contact with or ingestion of waste and subsurface soil that would result in an ELCR of 1 x 10^{-4} or more or a blood lead level in excess of 10 µg/dL.

2.11 DESCRIPTION OF ALTERNATIVES

This section describes the alternatives considered to address waste and contaminated subsurface soil at CSA 3 and Landfill 5.

Land Use Controls

LUCs are common elements of Alternatives 2, 3 and 5 for CSA 3 and Alternatives 2, 3, 6 and 8 for Landfill 5. LUCs are necessary because unacceptable risk could result from unrestricted use of CSA 3 and Landfill 5, particularly residential and recreational use.

This section provides information about the LUCs that will be applicable to each of the alternatives. The primary elements of the LUCs, which will be detailed in the Remedial Design Documents, are included in this DD.

All LUCs will be included in the 5-year reviews required under CERCLA and NCP, as well as the more frequent monitoring and reporting required. The Army in conjunction with the Navy and Army Reserve will be responsible for implementing and maintaining LUCs prior to transfer to a non-federal entity. After transfer, it is anticipated that the transferee and any subsequent property owners and users will be responsible for maintaining and enforcing LUCs, in accordance with the terms outlined in transfer or other appropriate documentation, and in accordance with 35 Illinois Administrative Code 742.1010. The LUC objectives are to prevent exposure of future residents, recreational visitors, or industrial and commercial workers to remaining contamination through contact with or ingestion of waste or contaminated soil by prohibiting residential and recreational use, and any intrusive activities. These controls will act as barriers to the dermal and ingestion exposure pathways by prohibiting activities that would potentially complete those pathways.

Definition: The term "land use control" means any restriction or control arising from the need to protect human health and the environment that limits the use of or exposure to environmentally contaminated media at any site on property controlled by the Navy and the Army Reserve. The term includes controls on access (e.g., engineered barriers, such as caps, and physical non-engineered mechanisms, such as fences or security guards). Additionally, the term encompasses both affirmative measures to achieve the desired control (e.g., night lighting of an area) and prohibitive directives (e.g., no drilling of drinking water wells). The term also includes "institutional controls" which are legal or administrative mechanisms for implementing a restriction on land use.

Implementation: The Army is responsible for implementation of LUCs at CSA 3 and Landfill 5, **as these sites will remain in Army control.** There are no plans to transfer either CSA 3 or Landfill 5 out of DoD control; so physical engineered LUCs, such as, fences and signs, will be used to contain contamination and restrict access to the sites. Should either CSA 3 or Landfill 5 be transferred from DoD control, it is anticipated that the transferee and subsequent property owners and users will be responsible for maintaining and enforcing LUCs in accordance with the terms outlined in transfer or other appropriate documentation. In addition, upon transfer, legal LUCs, as set forth in 35 Illinois Administrative Code 742.1010, such as deed restrictions will be used.

Enforcement: The Army in conjunction with the Navy and Army Reserve will be responsible for implementing and maintaining LUCs.

Any non-compliance issues will be resolved with Illinois EPA.

2.11.1 Coal Storage Area 3

Five remedial alternatives were evaluated to address the waste and contaminated subsurface soil at CSA 3. Alternatives 1 through 4 were presented in the FS; alternative 5 was developed upon further consideration of existing site conditions and current and anticipated future land uses. These alternatives include:

- Alternative 1: No Action
- Alternative 2: Limited Actions
- Alternative 3: In Situ Solidification/Stabilization
- Alternative 4: Off-site Disposal
- Alternative 5: Limited Action with Targeted Excavation

2.11.1.1 Alternative 1: No Action.

This alternative involves no remedial action and would leave the contaminated soil in place. It would not be effective in meeting the RAO.

Key components of the no action alternative are as follows:

- No restrictions, controls, or active remedial measures are applied to the site.
- This alternative is required by the NCP to be evaluated and serves as a baseline for evaluating the other alternatives.

Common elements and distinguishing features of the no action alternative are as follows:

- No ARARs apply to this alternative.
- This alternative would not be effective in the long term for protecting human health and the environment.
- No waste and contaminated subsurface soil would be removed or treated, disposed of off site, or managed on site in a containment system.
- Residual future risk would remain at the site.

Estimated time for implementation:	None
Estimated time to meet RAO:	Indefinite

Estimated capital cost:	None
Estimated annual O&M cost:	None
Estimated total present worth cost:	None

The expected outcome of the no action alternative is as follows:

- No impacts to the community, current occupants, workers, or the environment are associated with this alternative because it involves no construction.

2.11.1.2 Alternative 2: Limited Actions

This alternative involves implementing LUCs to limit access and prevent potential exposure to waste and contaminated subsurface soil. Residual contamination would remain at the site, so there is potential long-term risk to human health. LUCs would be designed to limit future land use and restrict certain construction activities at CSA 3.

Key components of the limited actions alternative are as follows:

- The LUC objectives for this alternative are to prevent residential or recreational use or any intrusive activities. The actual implementation actions to achieve these LUC objectives will be described in detail in the remedial design document for the selected alternative.
- This alternative would require inspection and maintenance activities to monitor its effectiveness.

Common elements and distinguishing features of this alternative are as follows:

- LUCs will restrict future excavation or construction to limit potential human contact with elevated concentrations of contaminants in waste and subsurface soil at the site.

Estimated time for implementation:	Less than 1 year
Estimated time to meet RAO:	Less than 1 year
Estimated capital cost:	$27,435
Estimated annual O&M cost:	$4,800
Estimated total present worth cost:	$90,940

- The estimated total present worth cost is based on a 7 percent interest rate for a 30-year period.

The expected outcomes of this alternative are as follows:

- The timeframe to achieve this alternative is less than 1 year. Because LUCs will restrict land use from potential future excavation, intrusive activities, and construction, the site will be available for industrial and commercial use.

- No impacts to the community, current occupants, workers, or the environment are associated with this alternative because it involves no construction.

- Residual contamination will remain at the site under this alternative, so there is potential long-term risk to human health.

2.11.1.3 Alternative 3: In Situ Solidification/Stabilization.

This alternative involves stabilizing and solidifying waste and contaminated subsurface soil in situ and implementing LUCs. The FS estimates that the volume of soil involved is approximately 1,250 cubic yards. Topsoil and a vegetative cover will be installed on top of the solidified and stabilized surface.

Key components of this alternative are as follows:

- A treatability study would be required to determine the appropriate solidification/stabilization reagent prior to final design of the treatment system. The reagent would be injected and mixed with the contaminated waste to immobilize PAHs. After curing, a vegetative cover will be placed on top of the solidified waste.

- The LUC objectives for this alternative are to prevent residential or recreational use or any intrusive activities. The actual implementation actions to achieve these LUC objectives will be described in detail in the remedial design document for the selected alternative.

- This alternative would require inspection and maintenance activities to assure its effectiveness.

Common elements and distinguishing features of the alternative are as follows:

- This alternative would be effective in preventing human exposure to the waste and contaminated subsurface soil.

- Technically and administratively this alternative would be difficult to implement because of the steep slope of the eastern portion of CSA 3 and its proximity to adjacent residential properties. In addition, this alternative requires a stable and relatively level base to implement.

Estimated time for implementation:	Less than 1 year
Estimated time to meet RAO:	Less than 1 year
Estimated capital cost:	$333,200
Estimated annual O&M cost:	$4,800
Estimated total present worth cost:	$396,705

- The estimated total present worth cost is based on a 7 percent interest rate for a 30-year period.

The expected outcomes of this alternative are as follows:

- The timeframe to implement this alternative is less than 1 year. Because Alternative 3 would permanently contain the contamination, the site would be available for industrial and commercial use.
- Minimal impacts to the community, current occupants, workers, and the environment are associated with this alternative.

2.11.1.4 Alternative 4: Off-site Disposal

This alternative involves the excavation of soil containing PAHs at concentrations above the RAO and off-site disposal of the waste and contaminated subsurface soil in a RCRA Subtitle D landfill (assuming the waste is nonhazardous). The FS estimates that the volume of soil involved is approximately 1,250 cubic yards.

Key components of this alternative are as follows:

- Construction equipment would excavate the entire area.
- Samples would be collected and analyzed to characterize the waste and contaminated subsurface soil prior to disposal.
- Clean backfill would be required to restore the CSA 3 area.
- Revegetation of the area would be completed.

Common elements and distinguishing features of the alternative are as follows:

- Implementation of this alternative would be effective in removing PAHs from CSA 3 and would achieve the RAO.
- The alternative would be difficult to implement because of the steep slope of the eastern portion of CSA 3 and its proximity to adjacent residential properties.
- Considerable erosion control planning would be necessary, but the excavations could be backfilled immediately, thus limiting the potential for erosion.
- Short-term occupational and residential exposures would be associated with the excavation and preparation of the waste and contaminated subsurface soil.
- There are no long-term effects because the contaminants would be removed.

Estimated time for implementation:	Less than 1 year
Estimated time to meet RAO:	Less than 1 year
Estimated capital cost:	$273,791
Estimated annual O&M cost:	Not Applicable
Estimated total present worth cost:	$269,323

- The estimated total present worth cost is based on a 7 percent interest rate for a 30-year period.

The expected outcomes of this alternative are as follows:

- The timeframe to achieve this alternative is less than 1 year. Because Alternative 4 would remove the waste and contaminated subsurface soils, the site would be available for unlimited use.
- Minimal impacts to the community, current occupants, workers, and the environment are associated with this alternative.

2.11.1.5 Alternative 5: Limited Action with Targeted Excavation

This alternative is a hybrid of Alternatives 2 and 4 from the FS. It includes erosion controls designed to protect the ravine slope immediately east of CSA 3 and excavation of areas where PAH concentrations exceed RAOs at depths less than 4 feet bgs. The FS estimates that the volume of soil involved is approximately 1,250 cubic yards. In addition, LUCs, monitoring, and maintenance will be required. Residual contamination would remain at the site, so there is potential long-term risk to human health.

The major components of the selected remedy are as follows:

- Erosion controls would be installed.
- Confirmation sampling will be conducted after excavation is complete to verify that an acceptable level of risk remains, and the post-removal risk will be verified from those results before the cover is completed.
- Two areas at the northern end of CSA 3 will be excavated and covered with topsoil.
- The ravine will be monitored to ensure the effectiveness of the remedial alternative, and maintenance or further improvements will be implemented as needed.
- The ravine slope will be thinned of excess, predominantly mid-story, non-native vegetation and seeded with a mix of native groundcover to improve erosion control along the slope.
- The LUC objectives for this alternative are to prevent residential or recreational use or any intrusive activities. The actual implementation actions to achieve these LUC objectives will be described in detail in the remedial design document for the selected alternative.

Common elements and distinguishing features of Alternative 5 are as follows:

- Implementation of this alternative will be effective in removing PAHs from the shallow subsurface of CSA 3 and will achieve the RAO. PAHs below 4 feet will not be removed.
- Short-term occupational exposures could result from the excavation of the waste and contaminated subsurface soil.
- Long-term effects are minimized because contaminants are removed from the shallow subsurface of CSA 3.

- This alternative would be effective in preventing human exposure to the waste and contaminated subsurface soil.

Estimated time for implementation:	Less than 1 year
Estimated time to meet RAO:	Less than 1 year
Estimated capital cost:	$134,000
Estimated annual O&M cost:	$5,600
Estimated total present worth cost:	$204,000

- The estimated total present worth cost is based on a 7 percent interest rate for a 30-year period.

The expected outcomes of this alternative are as follows:

- The timeframe to achieve this alternative is less than 1 year.

Because Alternative 5 would permanently remove contamination from the shallow subsurface to a depth of 4 feet bgs and restrict land use from potential future excavation, intrusive activities, and/or construction, the site would be available for industrial and commercial use.

- Minimal impacts to the community, current occupants, workers, and the environment are associated with this alternative.

2.11.2 Landfill 5

Eight alternatives were considered to address the waste and contaminated subsurface soil at Landfill 5. These alternatives include the following:

- Alternative 1: No Action
- Alternative 2: Limited Actions
- Alternative 3: In Situ Solidification/Stabilization
- Alternative 4: High-Temperature Thermal Desorption (HTTD), Chemical Extraction, and On-site Disposal
- Alternative 5: Chemical Oxidation, Chemical Extraction, and On-site Disposal
- Alternative 6: Capping
- Alternative 7: Off-site Disposal
- Alternative 8: Limited Action with Cover

All alternative designs would be affected by the presence of the sanitary and storm sewers and the water main beneath the landfill. All designs would also incorporate any engineering controls or shoring required to prevent undermining nearby structures or to stabilize unconsolidated fill outside the landfill boundary.

2.11.2.1 Alternative 1: No Action

This alternative involves no remedial action and would leave the waste and contaminated subsurface soil in place as is. It would not be effective in meeting the RAO. This alternative is required by the NCP to be evaluated and serves as a baseline for evaluating the other alternatives.

Key components of the no action alternative are as follows:

- No restrictions, controls, or active remedial measures are applied to the site.
- This alternative is required by the NCP to be evaluated and serves as a baseline for evaluating the other alternatives.

Common elements and distinguishing features of the no action alternative are as follows:

- No ARARs apply to this alternative.
- This alternative would not be effective in the long term for protecting human health and the environment.
- No waste or contaminated subsurface soils would be removed or treated, disposed of off site, or managed on site in a containment system.
- Residual future risk would remain at the site.

Estimated time for implementation:	None
Estimated time to meet RAO:	Indefinite
Estimated capital cost:	None
Estimated annual O&M cost:	None
Estimated total present worth cost:	None

The expected outcome of the no action alternative is as follows:

- No impacts to the community, current occupants, workers, or the environment are associated with this alternative because it involves no construction.

2.11.2.2 Alternative 2: Limited Actions

The proposed limited actions alternative would implement LUCs to limit access and prevent potential exposure to waste and contaminated subsurface soil. LUCs would be designed to limit future land use and restrict certain construction activities at Landfill 5. Although the RI concluded that there is no risk to groundwater at Landfill 5, groundwater monitoring would be conducted to ensure the effectiveness of the alternative is maintained.

Key components of this alternative are as follows:

- The LUC objective for this alternative is to prevent residential use or any intrusive activities. The actual implementation actions to achieve these LUC objectives will be described in detail in the remedial design document for the selected alternative. Until property transfer of Landfill 5 occurs, physical engineered LUCs to contain contamination and restrict access to the site, such as fences and signs will be used.

- Should landfill 5 be transferred out of federal government ownership in the future, legal LUCs, as codified in 35 Illinois Administrative Code 742.1010, such as deed restrictions, shall be used to achieve the LUC objectives. This alternative would require inspection and maintenance activities to monitor its effectiveness.

Common elements and distinguishing features of this alternative are as follows:

- LUCs will restrict future excavation or construction to limit potential human contact with elevated concentrations of contaminants in waste and subsurface soil at the site and will prohibit use of the property for residential purposes.

- This alternative would provide protection from human exposure to the waste and contaminated subsurface soil.

Estimated time for implementation:	Less than 1 year
Estimated time to meet RAO:	Less than 1 year
Estimated capital cost:	$142,019
Estimated annual O&M cost:	$82,186
Estimated total present worth cost:	$837,859

- The estimated total present worth cost is based on a 7 percent interest rate for a 30-year period.

The expected outcomes of the limited actions alternative are as follows:

- The timeframe to achieve this alternative is less than one year. Because LUCs would restrict land use from potential future excavation, intrusive activities, or construction, the site would be available for industrial and commercial use.

- No impacts to the community, current occupants, workers, or the environment are associated with this alternative because it involves no construction.

2.11.2.3 Alternative 3: In Situ Solidification and Stabilization

This alternative involves stabilizing and solidifying the waste and contaminated subsurface soil in situ and implementing LUCs. According to the FS, the volume of waste and soil above PRGs is approximately 98,862 cubic yards. Topsoil and a vegetative cover would be installed on top of the solidified and stabilized surface.

Key components of this alternative include the following:

- A treatability study would be required to determine the appropriate solidification/stabilization reagent prior to final design of the treatment system. The reagent would be injected and mixed with the contaminated waste to immobilize PAHs and lead. After curing, a vegetative cover would be placed on top of the solidified waste and subsurface soil.

- The LUC objective for this alternative is to prevent residential use or any intrusive activities.

The actual implementation actions to achieve these LUC objectives will be described in detail in the remedial design document for the selected alternative. Until property transfer of Landfill 5 occurs, physical engineered LUCs to contain contamination and restrict access to the site, such as fences and signs will be used.

Should landfill 5 be transferred out of federal government ownership in the future, legal LUCs, as codified in 35 Illinois Administrative Code 742.1010, such as deed restrictions, shall be used to achieve the LUC objectives.

- This alternative would require inspection and maintenance activities to assure its effectiveness.

Common elements and distinguishing features of this alternative are as follows:

- This alternative would be effective in preventing human exposure to the waste and contaminated subsurface soil.

- Implementation of this alternative would be difficult because of the presence of numerous buildings and roads on top of the landfill. Implementation would restrict the use of the roads and would require the demolition of Building 149. In addition, implementation could be hampered by sanitary and storm sewers and a water main beneath the landfill.

Estimated time for implementation:	Less than 2 years
Estimated time to meet RAO:	Less than 2 years
Estimated capital cost:	$9,611,734
Estimated annual O&M cost:	$75,379
Estimated total present worth cost:	$10,251,380

- The estimated total present worth cost is based on a 7 percent interest rate for a 30-year period.

The expected outcomes of the in situ solidification/stabilization alternative are as follows:

- The timeframe to implement this alternative is less than 2 years. Because Alternative 3 would permanently contain contamination, the site would be available for industrial and commercial use.

- Minimal impacts to the community, current occupants, workers, and the environment are associated with this alternative because it involves no construction.

2.11.2.4 Alternative 4: High-Temperature Thermal Desorption (HTTD), Chemical Extraction, and On-site Disposal

This alternative involves excavating the waste and subsurface soil contaminated with lead and PAHs at concentrations above the RAOs and treating the waste and soil through an engineered, on-site remedial action that involves HTTD and chemical extraction.

Key components of this alternative include the following:

- Soil preparation would be required prior to treatment and might include screening or crushing of coarse solids, and removal and offsite disposal of landfill waste debris.
- A treatability study would be required prior to full-scale implementation.
- The PAHs in the waste and subsurface soil would be removed first using a thermal desorption process.

  The off-gas from the process would be treated to remove particulates and contaminants. Particulates would be removed using conventional particulate removal equipment. Contaminants would be destroyed in a secondary combustion chamber or a catalytic oxidizer.
- Following the removal of the PAHs, the waste and subsurface soil would be treated by chemical extraction to remove the lead.
- Upon completion of the extraction process, the treated soil could be reused on-site as backfill after pH adjustment and addition of fertilizers. Otherwise, clean backfill would be required to restore Landfill 5.

Common elements and distinguishing features of this alternative are as follows:

- This alternative would be effective in removing the contaminants from the waste and subsurface soil.
- Short-term occupational exposures would be associated with the excavation and preparation of the waste and contaminated subsurface soil.
- There would be no long-term effects because the contaminants would be permanently removed.
- Implementation of this alternative would be difficult for several reasons. It would restrict the use of roads in the area and would require the demolition of Building 149. In addition, implementation could be hampered by sanitary and storm sewers and a water main beneath the landfill. It could also affect the stability of nearby structures and would therefore require the relocation of the tenants.
- This alternative requires high costs to design and implement.

- Waste residuals would require treatment and disposal.
- Costs, implementability, and effectiveness for this alternative depend on soil texture.

Estimated time for implementation:	2 years
Estimated time to meet RAO:	2 years
Estimated capital cost:	$34,828,644
Estimated annual O&M cost:	Not Applicable
Estimated total present worth cost:	$34,805,623

- The estimated total present worth cost is in 2003 dollars.

The expected outcomes of this alternative are as follows:

- The timeframe to achieve this alternative is 2 years. Because Alternative 4 would reduce the concentration of lead and PAHs in the waste and subsurface soils to levels below the RAOs, the site would be available for unrestricted use.
- Minimal impacts to the community, current occupants, workers, and the environment are associated with this alternative.

2.11.2.5 Alternative 5: Chemical Oxidation, Chemical Extraction, and Onsite Disposal

This alternative involves the excavation of waste and contaminated subsurface soil containing lead and PAHs concentrations above the RAOs and treatment through an engineered, onsite remedial action that involves chemical oxidation and chemical extraction.

Key components of this alternative include the following:

- A treatability study would be required prior to full-scale implementation.
- Excavated waste and contaminated subsurface soil would require preparation prior to treatment and might include screening or crushing of coarse solids and removal and off-site disposal of landfill waste debris.
- The PAHs would be removed first using a chemical oxidation process.
- Following the removal of the PAHs, the waste and contaminated subsurface soil would be treated using chemical extraction to remove the lead contamination.
- Upon completion of the extraction process, the treated waste and contaminated subsurface soil could be used on site as backfill after pH adjustment and addition of fertilizers.
- The concentrated metal residual would be processed off-site for disposal or recycling.

Common elements and distinguishing features of this alternative are as follows:

- Implementation of this alternative would be effective in removing the contaminants from the waste and subsurface soil.
- Short-term occupational exposures would be associated with the excavation and preparation of contaminated waste and contaminated subsurface soil.
- There would be no long-term effects because the contaminants would be permanently removed.
- Implementation of this alternative would be difficult for several reasons. It would restrict the use of roads in the area and would require the demolition of Building 149. In addition, implementation could be hampered by sanitary and storm sewers and a water main beneath the landfill. It could also affect the stability of nearby structures.
- This alternative requires high costs to design and implement.
- Costs, implementability, and effectiveness for this alternative depend on soil texture.

Estimated time for implementation:	2 years
Estimated time to meet RAO:	2 years
Estimated capital cost:	$42,599,203
Estimated annual O&M cost:	Not Applicable
Estimated total present worth cost:	$42,576,183

- The estimated total present worth cost is in 2003 dollars.

The expected outcomes of this alternative are as follows:

- The timeframe to achieve this alternative is 2 years. Because Alternative 5 would reduce the concentrations of lead and PAHs in the waste and subsurface soils to levels below the RAOs, the site would be available for unrestricted use.
- Minimal impacts to the community, current occupants, workers, and the environment are associated with this alternative.

2.11.2.6 Alternative 6: Capping

This alternative involves the installation of a cap, as well as implementing LUCs. The cap would consist of either a synthetic liner system or 2 feet of clay (with permeability of 1×10^{-7} centimeter per second [cm/sec] or less).

Key components of this alternative include the following:

- The LUC objective for this alternative is to prevent residential use or any intrusive activities. The actual implementation actions to achieve these LUC objectives will be described in detail in the remedial design document for the selected alternative. Until property transfer of Landfill 5 occurs, physical engineered LUCs to contain contamination and restrict access to the site, such as fences and signs will be used. Should landfill 5 be transferred out of federal government ownership in the future, legal LUCs, as codified in 35 Illinois Administrative Code 742.1010, such as deed restrictions, shall be used to achieve the LUC objectives. This alternative would require inspection and maintenance activities to monitor its effectiveness.

Common elements and distinguishing features of this alternative are as follows:

- Implementation of this alternative would prevent exposure to the waste and contaminated subsurface soil.
- This alternative would be difficult to implement, restricting the use of roads in the area and requiring the demolition of Building 149.
- This alternative requires high costs to design and implement.

Estimated time for implementation:	Less than 1 year
Estimated time to meet RAO:	Less than 1 year
Estimated capital cost:	$1,872,410
Estimated annual O&M cost:	$76,197
Estimated total present worth cost:	$2,522,207

- The estimated total present worth cost is in 2003 dollars.

The expected outcomes of this alternative are as follows:

- The timeframe to achieve this alternative is less than 1 year. Because Alternative 6 would permanently contain contamination, the site would be available for industrial and commercial use.
- Minimal impacts to the community, current occupants, workers, or the environment are associated with this alternative.

2.11.2.7 Alternative 7: Off-site Disposal

This alternative involves the excavation of waste and subsurface soil containing metal and PAHs at concentrations above the RAOs, and off-site disposal of the waste and contaminated subsurface soil in a RCRA Subtitle D landfill.

Key components of this alternative include the following:

- Construction equipment would be used to excavate the area.
- Samples would be collected and analyzed to characterize the waste and contaminated subsurface soil prior to disposal.
- Clean backfill would be required to restore the Landfill 5 area.
- Revegetation of the area would be completed.

Common elements and distinguishing features of this alternative are as follows:

- Implementation of this alternative would be effective in removing PAHs and lead from Landfill 5 and would achieve the RAO.
- Short-term occupational exposures would be associated with the excavation and transport of the waste and contaminated subsurface soil.
- Implementation would be difficult because it would restrict the use of roads in the area, require the demolition of Building 149, and could be hampered by the sanitary and storm sewers and water main beneath the landfill. The stability of nearby structures could also be affected.
- There are no long-term effects because the contaminants are permanently removed.
- This alternative requires high costs to design and implement.

Estimated time for implementation:	Less than 1 year
Estimated time to meet RAO:	Less than 1 year
Estimated capital cost:	$13,348,307
Estimated annual O&M cost:	Not Applicable
Estimated total present worth cost:	$13,325,287

- The estimated total present worth cost is in 2003 dollars.

The expected outcome of this alternative is as follows:

- The timeframe to achieve this alternative is less than one year. Because Alternative 7 would remove the waste and contaminated subsurface soils, the site would be available for unrestricted use.
- Minimal impacts to the community, current occupants, workers, and the environment are associated with this alternative.

2.11.2.8 Alternative 8: Limited Action with Cover

This alternative is a hybrid of Alternatives 2 and 6 from the FS. It combines elements of the limited action and capping alternatives. An engineering study will be conducted to determine whether or not the sub-base materials in areas currently covered by asphalt in good repair are consistent with the to-be-constructed cap materials; if they are, the areas will not be disturbed. Asphalt areas in poor condition will be removed to a depth that provides for replacement of both the asphalt and an additional 2 feed of clay overlaying a geocomposite liner. Figure 3 shows the approximate boundaries of the landfill which will be reconfirmed during construction of the cover. Some grading may be conducted across the unit for drainage and to provide elevations that allow for future use as required. No excavation or off-site disposal of soil or landfill waste is expected to be needed. The sub-base will be compacted and smooth-rolled allowing for proper placement of the geomembrane layer. A geomembrane that would meet the 1 x 10^{-7} cm/sec hydraulic conductivity value, for example, Claymax® or similar material, will be placed on top of the prepared sub-base. Two feet of clay will be placed on top of the geomembrane and compacted to create a low-permeability cover. Clay would meet the 10^{-5} cm/sec hydraulic conductivity value. Depending on the Army Reserve's or Navy's planned use for a particular area as parking or green space, either stone and/or asphalt will be placed on top of the clay or six inches of topsoil will be placed over the clay.

The topsoil will be vegetated to minimize erosive loss of topsoil. Erosion controls similar to those planned for CSA 3 would be implemented to protect the ravine slope adjacent to the north end of the landfill. Although the RI concluded that there is no risk to groundwater at Landfill 5, groundwater monitoring will be conducted to ensure the effectiveness of the alternative is maintained.

Key components of this alternative include the following:

- Site preparation would include identification of utility locations and clearance of obstacles or vegetation that would interfere with implementation.
- Erosion controls would be installed.
- Select concrete corings may be performed to determine the nature and thickness of the concrete roadway at 1st Street.
- For areas of the landfill already covered by asphalt, the asphalt and any underlying aggregate will be removed to a depth that provides an appropriate sub-base and the sub-base will be compacted and smooth-rolled. Grading may be conducted to create proper elevations for drainage.
- A geomembrane, such as Claymax®, or similar material will be placed over the graded sub-base and two feet of clay will be placed over the geomembrane and compacted to create a low-permeability cover with an hydraulic conductivity of less than or equal to 1 x 10^{-7} cm/sec.
- Depending on the planned use for a particular area, either six inches of asphalt/aggregate (for parking) or six inches of topsoil (for greenspace) will be placed over the clay. The topsoil will be vegetated to minimize loss of topsoil from erosion.
- Groundwater wells will be installed, and groundwater samples will be collected in accordance with the design document.

- The ravine slope will be thinned of excess, predominantly mid-story, non-native vegetation and seeded with a mix of native groundcover to improve erosion control along the slope.

- The LUC objective for this alternative is to prevent residential use or any intrusive activities. The primary elements of the LUCs, which will be detailed further in the Design Document, are included in this DD. All LUCs will be included in the 5-year reviews required under CERCLA and NCP. The Army in conjunction with the Navy and Army Reserve will be responsible for implementing and maintaining LUCs. Until property transfer of Landfill 5 occurs, physical engineered LUCs to contain contamination and restrict access to the site, such as fences and signs will be used. Should Landfill 5 be transferred out of federal government ownership in the future, legal LUCs, as codified in 35 Illinois Administrative Code 742.1010, such as deed restrictions, shall be used to achieve the LUC objectives. Common elements and distinguishing features of this alternative are as follows:

- This alternative would require inspection and maintenance activities to monitor its effectiveness.

- Implementation of this alternative would prevent human exposure to the waste and contaminated subsurface soil.

Estimated time for implementation:	Less than 1 year
Estimated time to meet RAO:	Less than 1 year
Estimated capital cost:	$1,483,000
Estimated annual O&M cost:	$15,000
Estimated total present worth cost:	$1,987,000

- The estimated total present worth cost is in 2004 dollars. The information in this cost estimate is based on the best available information regarding the anticipated scope of the remedial alternative. Changes in the cost estimate are likely to occur as a result of new information and data collected during the engineering design of the remedial alternative. Major changes may be documented in the form of a memorandum in the administrative record file, an explanation of significant differences (ESD), or a record of decision (ROD) amendment. This is an order-of-magnitude engineering cost estimate that is expected to be within +50 to -30 percent of the actual project cost.

The expected outcomes of this alternative are as follows:

- The timeframe to achieve this alternative is less than 1 year. Because Alternative 8 would permanently contain contamination, the site would be available for industrial or commercial use.

- Minimal impacts to the community, current occupants, workers, and the environment are associated with this alternative.

2.12 COMPARATIVE ANALYSIS OF ALTERNATIVES

The following sections summarize the comparative analysis of alternatives for CSA 3 and Landfill 5 against the U.S. EPA's nine evaluation criteria. The comparative analysis provides the information needed to decide which alternatives best satisfy the goals and expectations of the NCP.

The discussion of each evaluation criterion generally proceeds from the alternative that best satisfies the criterion to the one that least satisfies the criterion. The nine criteria are summarized as follows:

Overall protection of human health and the environment. This criterion addresses whether a remedy provides adequate protection of human health and the environment and describes how risks posed by each pathway are eliminated, reduced, or controlled through treatment, engineering controls, or LUCs.

Compliance with applicable or relevant and appropriate requirements. This evaluation criterion is used to determine whether a remedy will meet all ARARs or provide grounds for invoking a waiver of the requirements. This criterion includes chemical-, location-, and action-specific ARARs.

Long-term effectiveness and permanence. This criterion evaluates the long-term effectiveness of alternatives in protecting human health and the environment after response objectives have been met, in terms of the magnitude of residual risk and the adequacy and reliability of controls.

Reduction of toxicity, mobility, or volume through treatment. This criterion evaluates treatment technologies that an alternative may employ based on their degree of expected reduction in toxicity, mobility, or volume of hazardous material. This criterion also evaluates the irreversibility of the treatment process and the type and quantity of residuals that remain after treatment.

Short-term effectiveness. This criterion addresses the effectiveness of alternatives in protecting human health and the environment during remedial construction and implementation until the remedial action is complete.

Implementability. This criterion addresses the technical and administrative feasibility of alternatives and the availability of required goods and services. It assesses the ability to construct and operate the technology, the reliability of the technology, the ease of undertaking additional remedial actions, and the ability to obtain approvals from other agencies.

Cost. This criterion addresses the capital and O&M costs of each alternative and estimated total present worth cost of each alternative.

State acceptance. This criterion addresses whether the state concurs with, opposes, or has no comment on the Army's selected alternative.

Community acceptance. This criterion indicates whether community concerns are addressed by a remedy and whether the community has indicated a preferred remedy. Community acceptance of the Army's proposed plan was evaluated based on comments received during the public comment period.

Table 3 summarizes the comparative analysis of alternatives for CSA 3 and Landfill 5.

TABLE 3
COMPARATIVE ANALYSIS OF ALTERNATIVES

Remedial Alternative	Evaluation Criteria: *Threshold* — Overall Protection of Human Health and the Environment	*Threshold* — Compliance with ARARs	*Balancing* — Long-term Effectiveness and Permanence	*Balancing* — Reduction in TMV through Treatment	*Balancing* — Short-term Effectiveness	*Balancing* — Implementability	*Balancing* — Total Cost	*Modifying* — State Acceptance[1]	*Modifying* — Community[1] Acceptance
CSA 3									
No Action	○	○	○	○	●	●	0	U	U
Limited Action	●	●	◉	○	●	●	$90,940	U	A
In Situ Solidification/Stabilization	●	●	◉	◉	◉	◉	$396,705	A	A
Off-site Disposal	●	●	●	○	◉	◉	$269,323	A	A
Limited Action with Targeted Excavation[2]	●	●	◉	○	●	●	$204,000	A	A
Landfill 5									
No Action	○	○	○	○	●	●	0	U	U
Limited Action	●	○	◉	○	●	●	$837,859	U	A
In Situ Solidification/Stabilization	●	●	◉	◉	●	◉	$10,251,380	A	A
HTTD, Chemical Extraction and On-site Disposal	●	●	●	●	◉	◉	$34,805,623	A	A
Chemical Oxidation, Chemical Extraction, and On-site Disposal	●	●	●	●	◉	◉	$42,576,183	A	A
Capping	●	●	◉	○	●	◉	$2,522,207	A	A
Off-site Disposal	●	●	●	○	◉	◉	$13,325,287	A	A
Limited Action with Cover [3]	●	●	◉	○	●	●	$1,987,000	A	A

Source: Fort Sheridan Feasibility Study (FS): Department of Defense (DoD) Operable Unit (OU); Final Report, SAIC, May 2002

Key:

● = Fully meets criterion
◉ = Partially meets criterion
○ = Does not meet criterion
ARAR = Applicable or relevant and appropriate requirement
HTTD = High-temperature thermal desorption
TMV = Toxicity, mobility, or volume

Notes:

1 U = Unacceptable, A = Acceptable
2 Selected remedy for CSA 3 adds targeted excavations to the limited action alternative identified in the FS to assure consistency with remedial actions completed on the Surplus OU portion of the site.
3 Selected remedy for Landfill 5 combines elements of the limited action and capping alternatives identified in the FS to meet ARARs.

2.12.1 Coal Storage Area 3

The following sections evaluate the alternatives for CSA 3 in terms of the nine NCP criteria.

2.12.1.1 Overall Protection of Human Health and the Environment

All of the alternatives, except the no-action alternative, would be protective of human health and the environment by eliminating, reducing, or controlling risks posed by the site through treatment of waste and contaminated subsurface soil contaminants, engineering controls, or institutional controls.

Alternative 4 would provide adequate protection of human health and the environment through the removal of waste and contaminated subsurface soil.

Alternative 5 would provide adequate protection of human health and the environment through partial removal of waste and contaminated subsurface soil and by restricting access to subsurface soil and use of the area, thereby reducing direct contact with or ingestion of remaining waste. Cover maintenance and erosion controls would be required to ensure total protectiveness.

Alternative 3 would provide adequate protection of human health and the environment by reducing the mobility and toxicity of the contamination. In addition, human health risks associated with ingestion and dermal contact would be reduced to levels below regulatory risk criteria by eliminating the direct contact and ingestion pathways.

Alternative 2 would provide adequate protection of human health and the environment by restricting access and the use of the area, thereby reducing direct contact with and ingestion of waste and contaminated subsurface soil.

2.12.1.2 Compliance with Applicable or Relevant and Appropriate Requirements

Section 121(d) of CERCLA and NCP Section 300.430(f)(1)(ii)(B) require that remedial actions at CERCLA sites at least attain legally applicable or relevant and appropriate Federal and State requirements, standards, criteria, and limitations, which are collectively referred to as "ARARs," unless such ARARs are waived under CERCLA section 121(d)(4).

Applicable requirements are those cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under Federal environmental or State environmental or facility siting laws that specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance found at a CERCLA site. Only those State standards that are identified by a State in a timely manner and that are more stringent than Federal requirements may be applicable. Relevant and appropriate requirements are those cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under Federal environmental or State environmental or facility siting laws that, while not "applicable" to a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a CERCLA site, address problems or situations sufficiently similar to those encountered at the CERCLA site that their use is well suited to the particular site.

Only those State standards that are identified in a timely manner and are more stringent than Federal requirements may be relevant and appropriate.

All alternatives, except the No Action alternative, would comply with chemical-, action- and location-specific ARARs.

2.12.1.3 Long-Term Effectiveness and Permanence

Each alternative, except the No Action alternative, provides some degree of long-term protection.

Alternatives 4 and 5 would be effective and permanent on site. However, the long-term effectiveness and permanence off site depends on the containment controls of the off-site disposal facility.

Because soil contaminated with PAHs would remain on site, Alternatives 2, 3, 4, and 5 provide protection as long as the LUCs are maintained.

2.12.1.4 Reduction of Toxicity, Mobility, or Volume through Treatment

Alternative 3 includes treatment that would reduce toxicity and mobility. However, volume would not be reduced through the solidification and stabilization process; instead, modest volume increases are typical from reagent addition. Contaminant levels in the waste and subsurface soil would be diluted in proportion to the volume increase, but the contaminants would be immobilized.

Alternatives 4 and 5 would reduce the overall toxicity or volume but would not reduce the mobility of the contaminants through treatment.

Alternatives 1 and 2 do not include treatment as a component of the remedy. Therefore, these alternatives would not reduce the toxicity, mobility, or volume of contamination at the site through treatment.

2.12.1.5 Short-Term Effectiveness

Alternative 1 would pose no additional risk to the community, workers, or the environment as a result of implementation.

Alternative 3 would pose no significant risks to the community or site workers. The treatment time is expected to be less than 1 year.

Alternative 2 would pose a minimal short-term risk to the community. The implementation time of this alternative is estimated at less than 1 year.

Alternatives 4 and 5 pose limited risk to on-site workers, the community, and the environment. Risks to on-site workers from PAHs in waste and subsurface soil during the excavation and transport would be mitigated and addressed through a health and safety plan. The risk to the community would be minimal and due primarily to the transport of contaminated soil on public roads. Proper soil handling techniques would be implemented to prevent or minimize adverse environmental impacts due to soil erosion or soil transport.

More waste and soil would need to be excavated and transported under Alternative 4 than under Alternative 5. It is anticipated that either alternative would be completed in less than 1 year.

2.12.1.6 Implementability

Alternatives 1 and 2 are readily implementable.

Alternative 5 is technically and administratively feasible. Because targeted excavations will be used, disturbance of the site area and the slope will be minimized. All services and materials required for this alternative are readily available.

Alternative 3 is technically and administratively feasible. The eastern portion of the site is steeply sloped, which may affect the implementation of this alternative because a stable, relatively level base is required to operate the auger/injection machinery effectively and safely. Prior to full-scale implementation, a treatability study is required to optimize the stabilizing and binding reagent. All services and materials required for this alternative are readily available.

Alternative 4 is technically feasible but difficult to implement because of the steep slope on the eastern portion of the site. Considerable erosion control planning would be necessary. All services and materials required for this alternative are readily available.

2.12.1.7 Cost

The estimated present worth costs for the alternatives, not including the No Action alternative range from $90,940 for Alternative 2 to $396,705 for Alternative 3. Present worth costs were calculated based on a 7% interest rate for a 30-year period. Costs are listed in Table 3.

2.12.1.8 State/Support Agency Acceptance

U.S. EPA and Illinois EPA submitted written comments on the proposed plan for CSA 3. Specific comments and the Army's responses are included in the responsiveness summary (Appendix B).

2.12.1.9 Community Acceptance

Two local municipalities and the Lake County Health Department and Community Health Center submitted written comments on the proposed plan for CSA 3. Specific comments and the Army's responses are included in the responsiveness summary.

2.12.2 Landfill 5

2.12.2.1 Overall Protection of Human Health and the Environment

All of the alternatives, except the no-action alternative, are protective of human health and the environment by eliminating, reducing, or controlling risks posed by the site through treatment of waste and contaminated subsurface soil, engineering controls, or institutional controls.

Alternatives 6 and 8 would provide adequate protection of human health and the environment through containment of the lead- and PAH-contaminated waste and contaminated subsurface soil and the reduction of the direct contact and ingestion exposure pathways. Following the implementation of this alternative, the risks associated with the potential exposure to the contaminants through ingestion and dermal contact would be eliminated. Cover maintenance, LUCs and erosion controls would be required to ensure total protectiveness.

Alternative 7 would provide adequate protection of human health and the environment through the removal of waste and contaminated subsurface soil from the site.

Alternatives 3, 4, and 5 would be protective of human health and the environment through use of treatment. These alternatives would reduce the mobility and toxicity of the contamination. Human health risk posed through ingestion and dermal contact would be reduced by eliminating the pathways.

Alternative 2 would protect human health and the environment by restricting access to the site. However, no environmental improvement is achieved after this alternative is implemented.

2.12.2.2 Compliance with Applicable or Relevant and Appropriate Requirements

All alternatives, except the No Action alternative and Alternative 2, would comply with chemical-, action- and location-specific ARARs.

2.12.2.3 Long-Term Effectiveness and Permanence

Each alternative, except the No Action alternative, provides some degree of long-term protection.

Alternative 7 would be effective and permanent on site. However, the long-term effectiveness and permanence off site depends on the containment controls of the off-site Landfill.

Alternatives 6 and 8 would contain and prevent direct contact with and ingestion of the concentrations of lead and PAH leading to permanent reduction in risk associated with Landfill 5.

At the conclusion of remedial activities for Alternatives 4 and 5, the concentrations of lead and PAHs in the waste and subsurface soils at Landfill 5 would be below the RAOs, reducing the residual risk associated with Landfill 5.

Because waste and subsurface soil contaminated with lead and PAHs would remain on site, Alternatives 2 and 3 provide partial protection.

Although some contamination above unrestricted use levels remains under Alternatives 2, 3, 6, and 8, protection is maintained as long as LUCs are maintained and enforced.

2.12.2.4 Reduction of Toxicity, Mobility, or Volume through Treatment

Alternatives 4 and 5 would reduce the overall toxicity, mobility, and volume through treatment. The removal of PAHs and lead from the waste and contaminated subsurface soil would decrease the toxicity of the contaminants and reduce risk within the site. Because PAHs and lead would be removed from the site, the volume and mobility of contaminants would be reduced. These alternatives satisfy the statutory preference for treatment.

Alternative 7 would not reduce the overall toxicity and volume. Mobility would be reduced because the waste and contaminated subsurface soil would be contained in a landfill. A limited liability for future impacts to human health and the environment exists in the event of a failure in the landfill containment controls.

Alternative 3 includes treatment that would reduce toxicity and mobility. However, volume is not reduced through the solidification/stabilization process; instead, modest volume increases are typical from reagent addition.

Contaminant levels in the waste and contaminated subsurface soil would be diluted in proportion to the volume increase, but the contaminants would be immobilized.

Alternatives 1, 2, 6 and 8 do not use treatment.

2.12.2.5 Short-Term Effectiveness

Alternatives 1, 2, and 3 would pose no significant risks to the community or site workers. The treatment time is expected to be less than 2 years.

Alternative 4 poses minimal risk to on-site workers, the community, and the environment. Risks to on-site workers from lead and PAH contaminated waste and subsurface soil during the implementation of this alternative would be mitigated and addressed through a health and safety plan. Air emissions would be treated to remove particulate and gaseous emissions and eliminate the environmental risks to the community. Proper handling of waste and contaminated subsurface soil throughout the treatment process would be applied to prevent or minimize adverse environmental impacts. Applicable transportation laws and regulations would be followed to minimize the potential for spills and to reduce adverse impacts on the community. The treatment time is expected to be approximately 2 years.

Alternative 5 poses minimal risk to on-site workers, the community, and the environment. Risks to on-site workers from lead- and PAH-contaminated waste and subsurface soil during the implementation of this alternative would be mitigated and addressed in a health and safety plan.

Waste generated during treatment would be controlled to reduce or eliminate the environmental risks to the community. Proper handling of waste and contaminated subsurface soil throughout the treatment process would prevent or minimize adverse environmental impacts. Applicable transportation laws and regulations would be followed to minimize the potential of spills and to reduce adverse impacts on the community. The treatment time is expected to be approximately 2 years.

Alternatives 6, 7, and 8 pose minimal risk to on-site workers, the community, and the environment. Risks to on-site workers from lead- and PAH-contaminated waste and subsurface soil during the implementation of this alternative would be mitigated and addressed through a health and safety plan. Environmental impacts to the community would be minimal. Proper soil handling techniques would be implemented to prevent or minimize adverse environmental impacts due to soil erosion or soil transport. Implementation time is expected to be less than 1 year.

2.12.2.6 Implementability

Alternatives 1 and 2 are readily implementable.

Alternative 8 is technically and administratively feasible. All services and materials required are readily available.

Alternatives 3 and 6 are technically and administratively feasible. Prior to full-scale implementation, a treatability study would be necessary to optimize the stabilizing and binding reagent. This alternative would require additional time to demolish Building 149, and locate sanitary and storm sewers and the force main beneath the landfill. All services and materials required for this alternative are readily available.

Alternative 7 is technically and administratively feasible. This alternative would require additional time to demolish Building 149, and locate sanitary and storm sewers and the force main beneath the landfill. In addition, traffic on the roads on top of Landfill 5 would be diverted during the implementation of this alternative. All services and materials required for this alternative are readily available.

Alternative 4 is technically and administratively feasible. Prior to full scale implementation, a treatability study would be necessary. Although a permit would not be required to operate the HTTD, a lengthy shakedown period may be needed to assure compliance with state ARARs.

This alternative would require additional time to demolish Building 149, and locate sanitary and storm sewers and the force main beneath the landfill. In addition, traffic on the roads on top of Landfill 5 would be diverted during the implementation of this alternative. All services and materials required for this alternative are readily available.

Alternative 5 is technically and administratively feasible. Prior to full-scale implementation, a treatability study would be necessary. This alternative would require additional time to demolish Building 149, and locate sanitary and storm sewers and the force main beneath the landfill. In addition, traffic on the roads within Landfill 5 would be diverted during the implementation of this alternative. All services and materials required for this alternative are readily available.

2.12.2.7 Cost

The estimated present worth costs for the alternatives, not including the No Action alternative, range from $837,859 for Alternative 2 to $42.5 million for Alternative 5. Present worth costs were calculated based on a 7% interest rate for a 30-year period. Costs are listed in Table 3.

2.12.2.8 State/Support Agency Acceptance

U.S. EPA and Illinois EPA submitted written comments on the proposed plan for Landfill 5. Specific comments and the Army's responses are included in the responsiveness summary included as Appendix B to this DD.

2.12.2.9 Community Acceptance

Two local municipalities and the Lake County Health Department and Community Health Center submitted written comments on the proposed plan for Landfill 5. Specific comments and the Army's responses are included in the responsiveness summary included as Appendix B to this DD.

2.13 PRINCIPAL THREAT WASTES

Hazardous substances are present in the waste and contaminated subsurface soils at CSA 3 and Landfill 5. However, consistent with 40 CFR 300.430(a)(1)(iii)(A) and (B), these substances are considered to be low-level wastes because of their low concentrations and toxicity.

2.14 SELECTED REMEDY

Before selecting the remedial options for CSA 3 and Landfill 5, the Army carefully considered the results of assessments conducted to determine potential risks (current and future) posed by the areas to human health and the environment.

An HHRA was conducted in accordance with prescribed U.S. EPA guidance to determine the potential for adverse human health effects from contaminants on the DoD property. Both current and hypothetical future land uses at the DoD OU of Fort Sheridan were evaluated assuming that any existing LUCs (such as fences) would be removed and that no further remedial action would occur.

The ingestion of contaminants in groundwater was not considered under current or hypothetical future land-use scenarios because (1) the groundwater migration pathway is not complete, (2) a public water supply is available and used in the site area, (3) CSA 3 and Landfill 5 are not suitable locations for developing a local water supply, and (4) local ordinances prohibit the development of groundwater resources as a potable water supply. In addition, the BERA conducted to evaluate potential adverse effects to animals or plants found no contaminants of ecological concern at CSA 3 or Landfill 5.

Based on CERCLA, BRAC program goals, and future land use plans, Alternative 5, Limited Action with Targeted Excavation, was selected for CSA 3 (Figure 2). Similarly, Alternative 8, Limited Action with Cover, was selected for Landfill 5.

These alternatives satisfy the threshold remedy selection criteria: protection of human health and the environment, and compliance with ARARs. In addition, the Army considers these alternatives to be cost–effective solutions that will provide long-term protection. The alternatives can be readily implemented with minimal short-term risks to on-site workers, the community, and the environment.

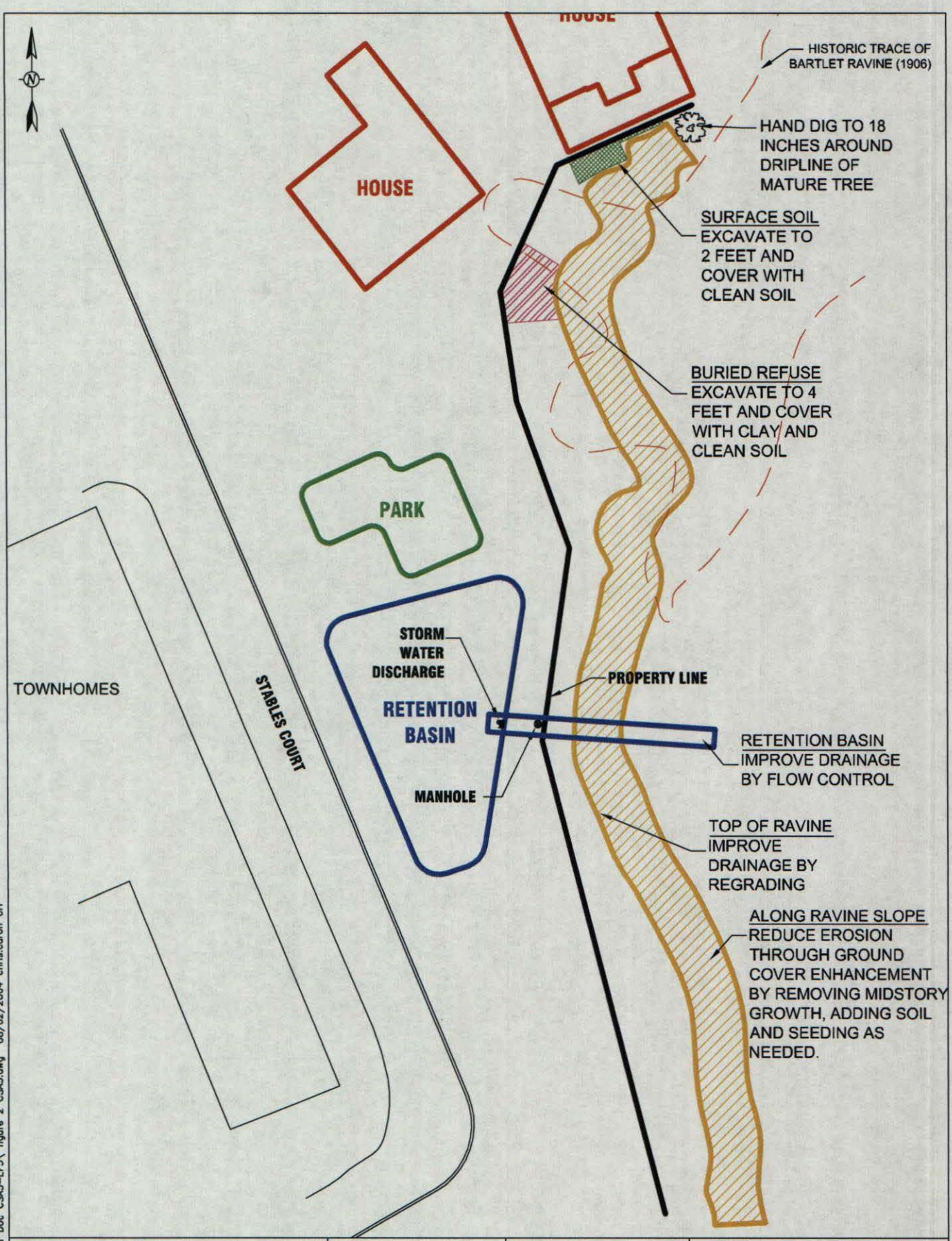
As defined by the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), acceptable exposure levels to known or suspected carcinogens are generally concentration levels that represent an excess lifetime cancer risk to an individual between 1×10^{-4} and 1×10^{-6}, based on a dose-response relationship. These levels are considered generally acceptable for industrial workers under an industrial land use scenario only. The point of departure is 1×10^{-6}, and risk below that level can be interpreted as unconditionally acceptable for any future industrial or residential land use. The final RAO for CSA3 and Landfill 5 is a human health risk value of 1×10^{-6}, but the final residual risk level may be within the risk management range of 1×10^{-6} to 1×10^{-4}, or less than 1×10^{-6}. Because contaminated material will be left in place on CSA 3 and Landfill 5, LUCs are necessary to ensure the protectiveness of the alternatives. Appropriate procedures will be included in design documents to ensure the LUCs will be maintained to be protective of human health and the environment.

The Army will be responsible for ensuring compliance with use restrictions necessary to protect human health and the environment.

2.14.1 CSA 3 – Limited Action with Targeted Excavation

Limited Action with Targeted Excavation (see Figure 2 – CSA 3) will include erosion controls designed to protect the ravine slope immediately east of CSA 3 and excavation of areas where PAH concentrations exceed RAOs at depths of 4 feet bgs or less. In addition, LUCs, monitoring, and maintenance will be required. Signs will be placed along the area adjacent to CSA 3 and will state that disturbance, digging or dumping in the area is prohibited. A telephone number will be posted to encourage people to call if any excavation, dumping or erosion is noticed.

The RAO for CSA 3 is to prevent the exposure of future residents, recreational visitors, or industrial and commercial workers from contact with PAHs through direct contact with or ingestion of waste and subsurface soil that would result in an ELCR of 1×10^{-4} or more.



KEMRON Tetra Tech EM, Inc. Fort Sheridan Environmental Restoration Team

0 25 50
SCALE IN FEET

FIGURE 2

COAL STORAGE AREA 3 REMEDY
DECISION DOCUMENT - CSA3
FORT SHERIDAN, ILLINOIS

G:\G\1135\Decision Doc CSA3-LF5\ figure 2 CSA3.dwg 08/02/2004 chris.caron CH

CSA 3 currently includes the newly graded area at the top of a ravine established as part of the Surplus OU remediation of CSA 3. A storm water retention basin, playground, and two new homes have been built on this remediated area; therefore, the design of the erosion controls will focus on enhancing this residential and recreational area.

To install erosion controls on the west slope of the ravine, (1) surface debris will be removed, (2) shallow subsurface drainage trenches will be installed, (3) drainage from the existing retention basin will be improved; (4) gully erosion will be addressed with topsoil, and (5) the existing ground vegetation will be generally improved by selectively removing invasive trees, saplings, shrubs, and seedlings, and applying a mix of shade-tolerant native species suited to an open oak woods or savanna community. Old-growth trees in the ravine will be protected to the maximum extent possible. A detailed evaluation of existing vegetation and drainage patterns within the ravine will be conducted as part of the design phase of the project. Following implementation, the ravine will be monitored by the Army via quarterly visual inspections to ensure the effectiveness of the remedy and maintenance or further improvements will be implemented as needed.

Two areas at the northern end of CSA 3 will be excavated. These areas were identified by test pit sampling during the Phase III RI. The first area is located along the northernmost boundary of CSA 3. This area is about 60 feet long and 10 feet wide and will be excavated to 2 feet bgs to remove refuse and PAH contamination. Test results indicate that soil below 2 feet bgs does not contain contaminants at concentrations above the remedial goals. This area will be covered with topsoil, graded to enhance drainage, and revegetated. The second area is a 20- by 20-foot section near the north bend in the ravine. This area will be excavated to 4 feet bgs to remove any refuse and overburden soil. Confirmation samples will be collected along the walls of the excavation.

This area will be covered with 2 feet of compacted clay and 2 feet of topsoil, and then revegetated with small trees or bushes. The purpose of the excavation and cover is to provide a consistent 4-foot cover of clean soil over any refuse that may remain.

The LUC objective for this alternative is to prevent residential or recreational use or any intrusive activities.

The actual implementation actions to achieve these LUC objectives will be described in detail in the remedial design document for the selected alternative.

2.14.2 Landfill 5 – Limited Action with Cover

The remedy for Landfill 5, Limited Action with Cover (see Figure 3) includes site preparation, cover installation, and LUCs. This remedy is a hybrid of the limited action (Alternative 2) and capping (Alternative 6) alternatives identified in the FS.

The RAO for Landfill 5 is to prevent the exposure of future residents, recreational visitors, or industrial and commercial workers to PAHs and lead through direct contact with or ingestion of waste and subsurface soil that would result in an ELCR of 1×10^{-4} or more or a blood lead level in excess of 10 µg/dL.

Erosion controls similar to those planned for CSA 3 will be implemented to protect the ravine slope adjacent to the north end of the landfill. Signs will be placed along the area adjacent to Landfill 5 and will state that disturbance, digging or dumping in the area is prohibited. A telephone number will be posted to encourage people to call if any excavation, dumping or erosion is noticed.

Site preparation will include identification of utility locations and clearance of obstacles or vegetation that would interfere with remedy implementation. Although the RI concluded that there is no risk to groundwater at Landfill 5, groundwater monitoring will be conducted for 30 years to ensure the protectiveness of the alternative is maintained unless otherwise agreed to by Illinois EPA.

Groundwater monitoring will be conducted quarterly for one year, semi-annually for the following two years and annually for years four and five to assure effectiveness of the remedy. After the first two years of monitoring, the analyte list may be reduced if constituents in the leachate are below Groundwater Class II standards, and as approved by the Illinois EPA. The need for future groundwater sampling and analyses will be re-evaluated after five years of completed monitoring. At that time, a letter will be submitted to the Illinois EPA requesting concurrence to eliminate or reduce the groundwater monitoring plan. Illinois EPA's concurrence will be based on the available data and may require additional monitoring. The number and location of groundwater monitoring wells will be determined in consultation with Illinois EPA during the remedial design phase.

Select concrete corings may be performed to determine the nature and thickness of the roadway at 1st Street and its suitability as cover. For areas of the landfill already covered by asphalt, the asphalt and underlying aggregate will be removed to a depth that provides an appropriate sub-base and the sub-base will be compacted and smooth-rolled. Grading may be conducted to create proper elevations for drainage. A geomembrane, such as Claymax® or similar material with a hydraulic conductivity value of 1×10^{-7} cm/sec will be placed over the graded sub-base and two feet of clay will be placed over the geomembrane and compacted to attain a hydraulic conductivity value of 1×10^{-5} cm/sec. Depending on the planned use for a particular area, either 12 inches of asphalt/aggregate (9 inches of sub-base plus 3 inches of asphalt for parking) or six inches of topsoil (for greenspace) will be placed over the clay. The topsoil will be vegetated to minimize loss of topsoil from erosion.

The LUC objective for this alternative is to prevent residential use or any intrusive activities. The actual implementation actions to achieve these LUC objectives will be described in detail in the remedial design document for the selected alternative.

Until property transfer of Landfill 5 occurs, physical engineered LUCs to contain contamination and restrict access to the site, such as fences and signs will be used. Should landfill 5 be transferred out of federal government ownership in the future, legal LUCs, as codified in 35 Illinois Administrative Code 742.1010, such as deed restrictions, shall be used to achieve the LUC objectives. The selected alternative for Landfill 5 will comply with state action-specific ARARs identified in the FS as described below:

State ARAR	Description
IAC 807.305(c) – Final cover must include two feet of suitable compacted material	The final cover will include a geomembrane and two feet of compacted material.
IAC 807.502(a) and (b) – Final site design must minimize need for further maintenance; control post-closure releases of waste.	Further maintenance will be minimized and the design will prevent releases of waste. The final design will be presented in the remedial design documents for review and approval by the Illinois EPA.
IAC 811.110(g) – Requires deed notation for property transfer that identifies property as a use-restricted landfill	Landfill 5 is currently in federal government ownership. Should the property be transferred out of federal ownership, a deed notation will be provided. This LUC will be described in detail in the remedial design document.
IAC 811.111(c) – Contains specifications for maintenance and inspection of final cover and vegetation	Inspection frequency and maintenance schedules will be included in the remedial design.
IAC 811.111(d) – Planned uses of property should be included in postclosure care plan; uses must not disturb integrity or function of containment system	Planned property uses and their restrictions will be included in the LUC description of the remedial design.
IAC 811.314(b)(3)(A)(ii) – Low permeability layer compacted to 1 x 10^{-7} cm/sec hydraulic conductivity.	The geomembrane and compacted clay layer together will achieve 1 x 10^{-7} cm/sec hydraulic conductivity. This complies with IAC 811.314(b)(3)(A)(iii) which allows for alternative specifications for the layer provided the performance is equal or superior to (b)(3)(A)(ii).
IAC 811.314(c)(1) and (3) – Final protective layer will cover the entire low permeability layer and will support vegetation.	These requirements will be met in the design documents for review and approval by the Illinois EPA.
IAC 811.318 - Design, Construction, and Operation of Groundwater Monitoring Systems	Groundwater monitoring will be conducted to assure effectiveness of the remedy.
IAC 811.319 – Groundwater Monitoring Programs	Groundwater monitoring will be conducted to assure effectiveness of the remedy.
IAC 811.320 – Groundwater Quality Standards	Groundwater monitoring will be conducted to assure effectiveness of the remedy.
IAC 811.324 - Corrective Action Measures	These requirements will be met through compliance with the Five-Year Review program required under CERCLA Section 121(c).

2.14.3 Cost Estimate for Selected Remedy

A complete cost estimate summary for CSA 3 is provided in Table 4. A complete cost estimate for Landfill 5 is provided in Table 5. Table 5 assumes minimal groundwater monitoring at Landfill 5.

2.14.4 Expected Outcomes of Selected Remedy

CSA 3 will be available for recreational, industrial, or commercial use. Contaminated waste and subsurface soil will be permanently removed from the site. Administrative LUCs will be placed on future use of CSA 3. Existing DoD SOPs for intrusive activities on DoD installations (such as excavation) mandate that appropriate notification and safety measures be implemented and thus would safeguard against such activities within CSA3. Deed restrictions are not currently needed because DoD owns the land.

Landfill 5 will be available for industrial or commercial use. Administrative LUCs will be placed on future use of the landfill area. Existing DoD SOPs for intrusive activities on DoD installations (such as excavation) mandate that appropriate notification and safety measures be implemented and thus would safeguard against such activities within the landfill area. Deed restrictions are not currently needed because DoD owns Landfill 5. If Landfill 5 is transferred in the future, a deed restriction will be required in the FOST.

2.14.5 Statutory Determinations

CERCLA Section 121 establishes several statutory requirements and preferences. These requirements and preferences specify that, when complete, the selected remedial action for CSA 3 and Landfill 5 must be protective of human health and the environment and must comply with applicable or relevant and appropriate standards established under federal and state environmental laws, unless a statutory waiver is justified. The selected remedy also must be cost-effective and use permanent solutions and alternative treatment or resource recovery technologies to the maximum extent practicable. Finally, the statute includes a preference for remedies that employ treatment technologies that permanently and significantly reduce the volume, toxicity, or mobility of the hazardous substances as their principal element. The following sections discuss how the selected remedies meet statutory requirements.

2.14.5.1 Protection of Human Health and the Environment

The selected remedies for CSA 3 (Limited Action with Targeted Excavation) and Landfill 5 (Limited Action with Cover) are protective of human health and the environment, as required by Section 121 of CERCLA, because they prevent future residents, recreational receptors, industrial and commercial workers from direct contact with or ingestion of waste or contaminated subsurface soil in excess of concentrations that exceed the RAOs.

2.14.5.2 Compliance with ARARS

The remedial actions at CSA 3 and Landfill 5 will be conducted in compliance with state action-specific ARARs associated with construction and waste management. Specifically, at CSA 3 the excavation and construction will comply with sections of 35 IAC that pertain to identification and management of any hazardous wastes that might be found and disposed off site. State ARARs for Landfill 5 are described in Section 2.14.2. In addition, construction and implementation activities at both CSA 3 and Landfill 5 will comply with noise and fugitive emission requirements of Subtitle H and Subtitle B of 35 IAC.

TABLE 4
COST ESTIMATE SUMMARY FOR THE CSA 3 SELECTED REMEDY
FORT SHERIDAN, ILLINOIS

Item	Quantity	Units	Unit Cost	Extended Cost
Mobilization/Demobilization @ 5 %	1.0	ls	$3,744.50	$3,744.50
Survey	1.0	ls	$1,000.00	$1,000.00
Clearing and grubbing	0.5	ls	$6,000.00	$3,000.00
Selective thinning and clearing	0.8	acre	$12,000.00	$9,600.00
Silt fence during construction	1,500.0	lf	$2.00	$3,000.00
Erosion control	0.8	acre	$7,000.00	$5,600.00
Slope stabilization	0.8	acre	$5,000.00	$4,000.00
Slope seeding	0.8	acre	$10,000.00	$8,000.00
Slope mulching	0.8	acre	$6,000.00	$4,800.00
Chipping of cleared trees and disposal	1.0	ls	$6,000.00	$6,000.00
Excavation of area 1 and 2 and loading into truck	100.0	cy	$12.40	$1,240.00
Hauling and dumping at landfill	140.0	ton	$32.00	$4,480.00
Sampling and analysis - excavation	10	each	$700.00	$7,000.00
Sampling and analysis - clean fill	2.0	each	$1,000.00	$2,000.00
Backfill soil	150.0	cy	$25.00	$3,750.00
Topsoil	50.0	cy	$25.00	$1,250.00
Testing of backfill	1.0	ls	$1,200.00	$1,200.00
Trench excavation	50.0	cy	$8.40	$420.00
Storm water inlets including CI grates	2.0	each	$1,000.00	$2,000.00
Cut into existing manhole	1.0	each	$500.00	$500.00
8" HDPE storm water pipe	150.0	lf	$35.00	$5,250.00
Signs	8.0	each	$400.00	$3,200.00
Fine grading and seeding berm and disturbed areas	1,000.0	sy	$4.10	$4,100.00
			Subtotal	**$85,134.50**
			Bonds/Insurance (@ 2 %)	$1,700.00
			Construction Subtotal	**$86,834.50**
			Contingency (scope @ 15 % and bid @ 15 %)	$26,050.35
			SUBTOTAL	**$112,884.85**
			Project Management (@ 5 %)	$5,644.24
			CQA (@ 6 %)	$6,773.09
			Construction Management (@ 8 %)	$9,030.79
			TOTAL CAPITAL COST	**$134,332.97**
			USE	**$134,000.00**

Operating and maintenance Cost				
Item	**Quantity**	**Units**	**Unit Cost**	**Extended Cost**
Inspection	4	each	$500.00	$2,000.00
Project management	1	ls	$200.00	$200.00
Clean-out storm water inlets	2	each	$200.00	$400.00
Repair berm and reseed	1	ls	$3,000.00	$3,000.00
			Total annual O&M cost	**$5,600.00**
			PRESENT WORTH @ 7% over 30 years	**$69,490.40**
			USE	**$70,000.00**
			TOTAL = CAPITAL + O&M	**$204,000.00**

Notes:

cy	=	Cubic yard
lf	=	Linear feet
ls	=	Lump sum
sy	=	Square yards

TABLE 5
COST ESTIMATE SUMMARY FOR THE LANDFILL 5 SELECTED REMEDY
FORT SHERIDAN, ILLINOIS

Item	Quantity	Units	Unit Cost	Extended Cost
General				
Mobilization/Demobilization @ 5 %	1.0	ls	$47,257.83	$47,257.83
Utility Survey	1.0	ls	$5,000.00	$5,000.00
Temporary facilities	1.0	ls	$35,000.00	$35,000.00
Site preparation				
Clearing and grubbing	2.3	acre	$2,500.00	$5,750.00
Silt fence during construction	3,000.0	lf	$2.00	$6,000.00
Fence demolition	2,000.0	lf	$2.77	$5,540.00
Hauling/disposal of demolition debris and rubbish	100.0	cy	$50.00	$5,000.00
Bituminous pavement demolition (assume 4" thick)	12,000.0	sy	$6.40	$76,800.00
Miscellaneous demolition-utility relocation	1.0	ls	$50,000.00	$50,000.00
Abandon 4 wells and 2 piezometers	6	ea	$750	$4,500
Cap construction				
Imported clay material	10,000.0	cy	$15.00	$150,000.00
Clay installation, compaction, and testing	10,000.0	cy	$12.00	$120,000.00
Top soil material	2,500.0	cy	$12.00	$30,000.00
Top soil installation compaction and testing	2,500.0	cy	$8.00	$20,000.00
Storm water drainage, inlets, manholes	1.0	ls	$85,000.00	$85,000.00
Fine grading and seeding	13,000.0	sy	$4.10	$53,300.00
Install and develop monitoring wells	3	ls	$2,500	$7,500
Install 1 piezometer	1	ls	$1,500	$1,500
Roadway reconstruction				
New base course (10" compacted)	2,500.0	sy	$10.50	$26,250.00
Fine grading/prepare and roll sub-base	2,500.0	sy	$1.39	$3,475.00
Primer	900.0	gal	$3.15	$2,835.00
New bituminous pavement, binder course (1 ½" thick)	2,500.0	sy	$3.10	$7,750.00
New bituminous pavement, wearing course (1 ½" thick)	2,500.0	sy	$3.40	$8,500.00
Fine grade/prepare sub-base for concrete walk	440.0	sy	$1.39	$611.60
New concrete curb and gutter (6"x18")	500.0	lf	$13.85	$6,925.00
New concrete walk 6" thick	3,960.0	sf	$4.50	$17,820.00
Miscellaneous improvements				
Replace fencing	2,000.0	lf	$37.00	$74,000.00
Slope stabilization/erosion protection	2,200.0	sy	$25.00	$55,000.00
Land use controls				
Institutional restrictions	1.0	ls	$15,000.00	$15,000.00
Signs and survey	1.0	ls	$16,000.00	$16,000.00
Closeout report	1.0	ls	$30,000.00	$30,000.00
			Subtotal	**$972,314.43**
			Bonds/Insurance (@ 2 %)	$19,446.29
			Construction Subtotal	**$991,760.72**

Item	Quantity	Units	Unit Cost	Extended Cost
			Bid contingency @ 15 %)	$148,764.11
			SUBTOTAL	**$1,140,524.83**
			Project Management (@ 10 %)	$114,052.48
			Engineering design(@ 12 %)	$136,862.98
			Construction Management (@ 8 %)	$91,241.99
			TOTAL CAPITAL COST	**$1,482,682.28**
			USE	**$1,483,000.00**

Operation and Maintenance				
Item	**Quantity**	**Units**	**Unit Cost**	**Extended Cost**
Inspection (Quarterly)	4	day	$500.00	$2,000.00
Project management/scheduling/reporting	1	ls	$1000.00	$1,000.00
Repair bituminous pavement	1	ls	$10,000.00	$10,000.00
Cap repair and cutting	4	ea	$1000.00	$1,000.00
Debris cleaning of pipes and swales	1	ls	$1,000.00	$1,000.00
			Total annual O&M cost	**$15,000.00**
			PRESENT WORTH @ 7% over 30 years	**$198,544.00**
			Use	**$199,000.00**
Quarterly Sampling **(@ Year 1)**[1]			$12,000.00	$48,000.00
Semiannual sampling -Year 2 (Present worth factor 0.8734)[1]			$24,000.00	$20,962.00
Semiannual sampling – Year 3 (Present worth factor 0.8163)[1]			$24,000.00	$19,591.00
Annual sampling – Year 4 (Present worth factor 0.7629)[1]			$12,000.00	$9,155.00
Annual sampling – Year 5 (Present worth factor 0.7130)[1]			$12,000.00	$8,556.00
Closeout Report **(@ 30 years)**			$1,500.00	$200.00
			Total Sampling and Closeout	**$305,008.00**
			Use	**$305,000.00**
			Total = Capital + O & M + Sampling	**$1,987,000.00**

Notes:

cy = Cubic yard
ea = Each
gal = gallon
lf = Linear feet
sy = Square yards
sf = Square feet
ls = Lump sum

[1] Groundwater monitoring costs apply only if the groundwater monitoring is terminated at the end of the first five years of monitoring. Groundwater monitoring might be required for up to 30 years or more.

2.14.5.3 Cost Effectiveness

The cost of these selected remedies is proportional to their overall effectiveness, because they achieve an equivalent level of protectiveness as the other alternatives at a smaller unit cost. They are neither the least expensive nor the most expensive alternative considered. Except for the off-site disposal alternatives, all the alternatives considered by the Army require LUCs to maintain their effectiveness. The estimated cost for complete off-site disposal of CSA 3 and Landfill 5 is significant when compared with the selected alternatives. The cost of HTTD, chemical oxidation, and off-site disposal for Landfill 5 waste and soil is grossly excessive.

2.14.5.4 Utilization of Permanent Solutions and Alternative Treatment Technologies (or Resource Recovery Technologies) to the Maximum Extent Practicable

The selected remedies for CSA 3 and Landfill 5 use permanent solutions in a cost-effective manner to the maximum extent practicable. Treatment technologies were found to be impracticable because of the excessive cost and implementation problems when compared to the similar protectiveness and lower cost of the selected remedies.

2.14.5.5 Preference for Treatment as a Principal Element

The selected remedies do not meet the statutory preference for treatment as a principal criterion because no treatment is employed. Treatment was not considered easily implementable or cost-effective for CSA 3 and Landfill 5.

2.14.5.6 Five-Year Review Requirements

Because the selected remedies for CSA 3 and Landfill 5 will result in hazardous substances, pollutants, or contaminants remaining on site at concentrations above levels that allow for unlimited use and unrestricted exposure, a statutory review will be conducted within five years after initiation of remedial action and every five years thereafter as long as they are required to ensure that the remedy is, or will be, protective of human health and the environment.

2.14.6 Documentation of Significant Changes from Preferred Alternative of Proposed Plan

This Decision Document contains no significant changes from the preferred alternatives described in the Proposed Plan.

APPENDIX A
ADMINISTRATIVE RECORD

Fort Sheridan
Administrative Record

Last Updated
January 2004

DOC NO	I.R.	DOCUMENT TITLE	AUTHOR	DATE	RECIPIENT
1.001.1		Sanitary Landfill Closure, Fort Sheridan, Illinois	Greeley and Hansen	1978 Sep 01	IL EPA
1.002		Final Design Analysis Sanitary Landfill Closure	Greeley and Hansen	1980 Feb 01	US Army Corps of Engineers, Omaha
1.002.1		Archeological Investigations of the Fort Sheridan Military Reservation, Lake County, Illinois	Essenpreis, P.S. - P/PA Research Inc.	1980 Feb 01	Department of the Army Interagency Archeological Services - Atlanta
1.003		Feasibility Study to Determine the Use of On-site Soils for Landfill Cover Materials	Soil Testing Services, Inc.	1980 Jun 02	Benson, Doug - Facilities Engineering, Fort Sheridan, IL
1.005		Installation Assessment of Fort Sheridan and Joilet Training Area, Illinois	Chemical Systems Laboratory	1982 May 01	USATHAMA
1.007		Update of the Initial Installation Assessment of Fort Sheridan, Illinois	Environmental Science and Engineering	1987 Aug 01	USATHAMA
1.009	*	Enhanced Preliminary Assessment Report: Fort Sheridan, Illinois	Argonne National Laboratories	1989 Oct 01	USATHAMA
1.009.1.1		Installation Assessment Army Base Closure Program, Fort Sheridan, Lake County, Illinois	The Bionetics Corp.	1990 Apr 01	US EPA
1.009.2		Memorandum of Understanding (MOU) Between Department of the Army and the Department of the Navy, Transfer of Certain Properties at Fort Sheridan, Illinois	Secretary of Army and Sec. of Navy	1991 Aug 08	
1.009.3		Report of Findings for PCB Transformer Sampling Conducted at Fort Sheridan, Illinois	Environmental Science and Engineering	1992 Jun 11	USATHAMA
1.011	*	Environmental Assessment for the Disposal and Reuse of Fort Sheridan, Illinois, Final	Department of the Army	1993 Sep 01	
1.011.5	*	Community Environmental Response Facilitation Act (CERFA) Report	The Earth Technology Corporation	1994 Apr 01	US AEC
1.012.1	*	Former Fort Sheridan Unexploded Ordnance Survey, Final Technical Report	IT Corporation	1994 Jul 01	US AEC
1.017		Report of Sanitary Landfill Closure Site Inspection	Greeley and Hansen	1980 Jun 19	Fort Sheridan
1.020.4		Ordnance, Ammunition and Explosives Archives Search Report Findings for Fort Sheridan, Lake County, Illinois	U.S. Army Corps of Engineers, St. Louis District	1996 Mar 01	US AEC
1.020.5	*	Ordnance, Ammunition and Explosives Archives Search Report Conclusions and Recommendations for Fort Sheridan, Lake County, Illinois	U.S. Army Corps of Engineers, St. Louis District	1996 Mar 01	US AEC
1.025.1		E-mail-re: Fort Sheridan Landfill	Greek, WP - Army Reserve Native American Coordinator	2001 Oct 24	Bailliett, A.L. - Army
1.025.2		E-mail-re: Sheridan Pottery	Greek, WP - Army Reserve Native American Coordinator	2001 Oct 24	Bailliett, A.L. - Army
1.026		U.S. Army Closed, Transferring, and Transferred Range and Site Inventory for Fort Sheridan BRAC Property, Illinois, Final	URS Group, Inc.	2003 Mar 28	U.S. Army Environmental Center and Fort Sheridan, Illinois
2.018		Engineering Evaluation/Cost Analysis, Coal Storage Area 3, B42, B43, B77 (see separate report on shelf)	LAW Engineering and Environmental Services, Inc.	1997 Nov 01	US Army Corps of Engineers, Louisville District
2.019		Removal Action Work Plan, Fort Sheridan, IL. Coal Storage Area 3, B42, B43, B77 (see separate report on shelf, 2 volumes)	IT Corporation	1998 Apr 01	U.S. Army Corps of Engineers, Louisville District
2.019.1		Sand Sampling at CSA3, Fort Sheridan, Illinois	QST Environmental	1999 May 28	Bob Fileccia, U.S. Army Corps of Engineers, Louisville, KY
2.020	*	Final Non-Time-Critical Removal Action Completion Report, Buildings 42, 43, and 77 and Coal Storage Area 3, Fort Sheridan, Illinois	IT Corporation	1999 Jun 11	U.S. Army Corps of Engineers, Louisville District
2.021		Chain of Custody forms, Non-Time-Critical Removal Action, Buildings 42, 43, and 77, and Coal Storage Area 3	IT Corporation / QST Environmental Laboratories	1998 Mar-Dec	File

DOC NO	I.R.	DOCUMENT TITLE	AUTHOR	DATE	RECIPIENT
2.022.1.1		Final Non-Time-Critical Removal Action Completion Report Coal Storage Area 3, Buildings 42, 43, and 77, Fort Sheridan, Illinois	IT Corporation	1999 Jan 01	U.S. Army Corps of Engineers, Louisville District
2.031	*	Project Management Plan (PMP) for Environmental Restoration Project, Fort Sheridan, Illinois, Revision 2.0	Kemron Fort Sheridan Environmental Restoration Team	2002 Jul 30	U.S. Army FORSCOM BRAC Office
2.033	*	Sampling and Analysis Plan, Fort Sheridan Environmental Restoration Project	Kemron Fort Sheridan Environmental Restoration Team	2003 Mar 25	U.S. Army FORSCOM BRAC Office
3.028		Draft Final Remedial Investigation (RI)/Risk Assessment (RA) Report Remedial Investigation/Feasibility Study Fort Sheridan IL (3 Volumes)	Environmental Science and Engineering, Inc.	1992 Jun 01	USATHAMA
3.030		Letter-re: Comments on Draft Remedial Investigation/Risk Assessment	Torrisi, S.P. - USATHAMA	1992 Jun 17	Choi, S.S., US EPA
3.031		Letter-re: Review and Comments of the Draft Final Remedial Investigation (RI) Report, including Risk Assessment (RA)	Carter, J.E. - IL EPA	1992 Jul 27	Fendick, R., USATHAMA
3.033		Letter-re: Concerns and Recommendations Based on the Draft Final Remedial Investigation (RI) Report and Risk Assessment/Feasibility Study (RA/FS)	Choi, S. - US EPA	1992 Oct 06	Fendick, R., USATHAMA
3.035		Letter-re: Comments on Draft Remedial Investigation/Risk Assessment	Wooten, COL. R.G. - USA EC	1992 Oct 07	Choi, S.S., US EPA
3.040		Responses to Regulatory Agency Comments Regarding Remedial Investigation/Risk Assessment Report	Wooten, COL. R.G. - USA EC	1993 Feb 09	Nussbaum, S.D. - IL EPA
3.040.1		Letter - re: Fort Sheridan (Illinois) Geology Review, RI Comments Review, and RI Recommendations	Groen, J. - WW Engineering & Science	1993 Jun 25	Lietzke, T. - ARCS
3.041.1		Letter-re: IL EPA Comments to Overall Quality Assurance Project Plan	Nussbaum, S.D. - IL EPA	1993 Aug 15	Fendick, R. - US AEC
3.046		Letter-re: Review of Draft Final Overall Technical Plan, Sampling and Analysis Plan, Quality Assurance Project Plan, Remedial Investigation/Feasibility Study for Fort Sheridan, IL, August 1993	Ripley, L.J. - US EPA	1993 Nov 04	Stokke, S., HQ Fort McCoy
3.049		Lake County Health Department Closed Landfill Inspection Report	Pergams, R.; D. DeBennette - Lake County Health Department	1994 May 11	IL EPA
3.053		Shallow Groundwater Resource Classification, Fort Sheridan, IL	Environmental Science and Engineering	1994 Oct 25	USAEC
3.054		IL EPA comments Regarding Groundwater Classification Report	Nussbaum, S.D. - IL EPA	1994 Dec 22	Reilly, C. - Fort Sheridan BEC
3.054.1		Memorandum-re: Decision Tree for Management of IDW - soil only	Watson, R. - RCRA/CERCLA Coordinator	1994 Dec 29	Nussbaum, S.D. - IL EPA
3.054.2		Letter-re: Investigation Derived Waste	Nussbaum, S.D - IL EPA	1995 Mar 07	Reilly, C. - Fort Sheridan BEC
3.055		Letter-re: Questions Regarding IL EPA's Groundwater Classification Review Comments	Reilly, C. - Fort Sheridan BEC	1995 Jan 26	Nussbaum, S.D. - IL EPA
3.056		Letter-re: Questions Regarding IL EPA Groundwater Classification Document Review Comments	Reilly, C. - Fort Sheridan BEC	1995 Feb 27	Nussbaum, S.D. - IL EPA
3.057.2.2		Final Overall Quality Assurance Project Plan (QAPP) Remedial Investigation/Feasibility Study Fort Sheridan, Illinois (See separate report on shelf - 2 Volumes)	Environmental Science and Engineering	1995 Mar 15	US Army Environmental Center
3.068.3		Final Sampling and Analysis Plan for Background Sampling	Environmental Science and Engineering	1995 May 26	Lechner, Dr. Charles-USAEC
3.072		Groundwater Classification Document, Fort Sheridan, IL (See separate report on shelf - Volumes 1 & 2)	Environmental Science and Engineering	1996 Feb 01	US AEC
3.075	*	Radiological Assessment & Survey at Fort Sheridan	IL Dept. of Nuclear Safety	1996 Mar 11	Lake, Paul T. - IL EPA
3.113	*	Final Post Removal Action Risk Evaluation for Building 42, Building 43, Coal Storage Area 3, and Building 77 of the Surplus Operable Unit, Fort Sheridan, Illinois	QST Environmental, Inc.	1999 Jun 14	U.S. Army Environmental Center

DOC NO	I.R.	DOCUMENT TITLE	AUTHOR	DATE	RECIPIENT
3.120	*	Health and Safety Plan, Fort Sheridan Environmental Restoration Project, Revision 3.0	Fort Sheridan Restoration Team	2002 Apr 12	U.S. Army FORSCOM BRAC Office
3.122	*	Construction Quality Control Plan for Remedial Actions at the Fort Sheridan Base	HHSI Construction	2002 Jul	Kemron Fort Sheridan Environmental Restoration Team
3.123	*	Storm Water Pollution Prevention Plan for Construction Activities at the Fort Sheridan Base	Kemron Fort Sheridan Environmental Restoration Team	2002 Jul	
3.124		Waste Minimization Plan (WMP) for Environmental Restoration Project, Fort Sheridan, Illinois	Kemron Fort Sheridan Environmental Restoration Team	2002 Jul	U.S. Army FORSCOM BRAC Office
4.000.0		Target Chemical/Applicable or Relevant and Appropriate Requirements (ARARS), Determination Report, Fort Sheridan, Illinois, Draft	Environmental Science and Engineering	1991 Jun 27	U.S. Army Toxic and Hazardous Materials Agency
4.031		Geotechnical Information on Clay	Hard Hat Inc.	2003 Jul 15	Kemron Fort Sheridan Environmental Restoration Team
5.008		Action Memorandum Non-Time Critical Removal Action Coal Storage Area 3, Building 42, Building 43, and Building 77 Surplus Operable Unit, Fort Sheridan, Illinois	Higgins, Col. Roy L., U.S. Army	1998 Mar 03	
5.013		No Further Response Action Decision Paper, Building 42, Building 43, Building 77, and Coal Storage Area 3, Fort Sheridan	Fort Sheridan BRAC Cleanup Team	1999 Jun 01	File
5.014		Supplemental Action Memorandum, Change in the Scope of Response Action, Non-Time-Critical Removal Action, Coal Storage Area 3, Building 42, Building 43, and Building 77, Surplus OU, Fort Sheridan	Colonel Roy L. Higgins, Commander, Fort McCoy	1999 Jun 01	File
5.023	*	Proposed Plan, Coal Storage Area 3 and Landfill 5, Department of Defense Operable Unit, Fort Sheridan, Illinois, Final	Kemron Environmental Services Inc.	2003 Feb 18	U.S. Army BRAC Atlanta Field Office
6.103		Letter re: Responses to Illinois EPA's Comments on the Final Sampling and Analysis Plan, Revision 4.0, Dated December 2, 2002	Conrath, B. - IL EPA	2002 Dec 09	Bonilla, V. - Fort Sheridan Base Environmental Coordinator
6.104		Letter re: Quality Assurance Project Plan, Fort Sheridan Environmental Restoration Project, Revision 4.0	Conrath, B. - IL EPA	2003 Jan 07	Bonilla, V. - Fort Sheridan Base Environmental Coordinator
6.106		Letter re: Draft Proposed Plan for Coal Storage Area 3 and Landfill 5	Thompson, W.O. - US EPA	2003 Jan 17	Bonilla, V. - Fort Sheridan Base Environmental Coordinator
6.107		Letter re: Draft Proposed Plan for Coal Storage Area 3 and Landfill 5	Conrath, B. - IL EPA	2003 Jan 23	Bonilla, V. - Fort Sheridan Base Environmental Coordinator
6.109		Letter re: Responses to Comments on the Draft Proposed Plan for Coal Storage Area 3 and Landfill 5, Received during the February 12, 2003 BCT Meeting	Conrath, B. - IL EPA	2003 Feb 18	Bonilla, V. - Fort Sheridan Base Environmental Coordinator
6.110		Letter re: Addendum 1 to Fort Sheridan Environmental Restoration Project QAPP	Conrath, B. - IL EPA	2003 Feb 25	Bonilla, V. - Fort Sheridan Base Environmental Coordinator
6.112		Letter re: Preliminary Draft Land Use Control Memorandum of Agreement (LUC MOA) for Four Sites on the Former Fort Sheridan Army Base	Conrath, B. - IL EPA	2003 Mar 21	Bonilla, V. - Fort Sheridan Base Environmental Coordinator
6.114		Letter re: Final Draft Proposed Plan for Coal Storage Area 3 and Landfill 5	Thompson, W.O. - US EPA	2003 Mar 28	Bonilla, V. - Fort Sheridan Base Environmental Coordinator
6.115.1		Letter re: Final Proposed Plan for Coal Storage Area 3 and landfill 5 Department of Defense Operable Unit, Fort Sheridan, Illinois	Kuhn, Michael F., Lake County Health Dept.	2003 Apr 02	Thomsen, K.O. - Fort Sheridan Environmental Coordinator

DOC NO	I.R.	DOCUMENT TITLE	AUTHOR	DATE	RECIPIENT
6.119		Letter re: Proposed Plan for Landfill 5 and the Draft Technical Memorandum Issued at the April 15, 2003 BCT Meeting	Conrath, B. - IL EPA	2003 Apr 18	Bonilla, V. - Fort Sheridan Base Environmental Coordinator
6.121		Letter re: Final Proposed Plan for Coal Storage Area 3 and Landfill 5	Thompson, W.O. - US EPA	2003 Apr 21	Bonilla, V. - Fort Sheridan Base Environmental Coordinator
6.122		Response to April 10, 2003 IEPA Letter: Illinois EPA Issues and Concerns Regarding the Ongoing Remediation Activities at Fort Sheridan (letter and supporting documentation)	Blair, T.A. - Hard Had Services, Inc.	2003 Apr 24	Bolger, P. - KEMRON
6.123		Letter re: 0970555001/Lake County Fort Sheridan (BRAC) Superfund/Technical	Smith. C.L. - IL EPA Bureau of Land	2003 Apr 25	Bonilla, V. - Fort Sheridan Base Environmental Coordinator
6.129		Letter re: Regulatory Closure and Illinois EPA and US EPA Participation	Bohannon, D.L. - Department of the Army BRAC	2003 May 16	Schafer, G. - U.S. EPA
6.132		Letter re: Draft Technical Memorandum Landfill 5 Design and ARAR Analysis	Conrath, B. - IL EPA	2003 May 20	Bonilla, V. - Fort Sheridan Base Environmental Coordinator
6.133.1		Letter re: Response to April 21, 2003 Letter, Proposed Plan for Landfill 5	Thomsen, K.O. - Fort Sheridan Environmental Coordinator	2003 May 20	Thompson, W.O. - US EPA
6.134		Letter re: Response to April 18, 2003 Letter, CSA 3 and Landfill 5 Proposed Plan	Thomsen, K.O. - Fort Sheridan Environmental Coordinator	2003 May 23	Conrath, B. - IL EPA
6.135		Letter re: Response to April 18, 2003 Letter, CSA 3 and Landfill 5 Proposed Plan	Thomsen, K.O. - Fort Sheridan Environmental Coordinator	2003 May 23	Thompson, W.O. - US EPA
6.136		Letter re: Response to Illinois EPA Issues and Concerns Letter, dated April 8, 2003	Bergquist, T. KEMRON	2003 May 28	Bonilla, V. - Fort Sheridan Base Environmental Coordinator
6.137		Letter re: Final Quality Assurance Project Plan (QAPP), Rev. 4 and Army Response to Comments on Rev. 3	Thompson, W.O. - US EPA	2003 Jun 03	Bonilla, V. - Fort Sheridan Base Environmental Coordinator
6.139		Letter re: Draft Technical Memorandum Landfill 5 Design and ARAR Analysis	Conrath, B. - IL EPA	2003 Jun 18	Bonilla, V. - Fort Sheridan Base Environmental Coordinator
7.050	*	Finding of Suitability to Transfer (FOST) Former Coal Storage Area and Blacksmith's Shop Parcels, Final		1999 Jun 01	
8.009		Landfill 5 Risk Assessment - The Army Respone to Illinois EPA, May 20, 2003 Comments on April 2003 Draft Technical Memorandum, Landfill 5 Design and ARAR Analysis	No Author	2003 Jun 25	
9.001		Selected Legally Protected Animals	U.S. Army Engineer Waterways Experiment Station	1975 Jun 01	U.S. Army
9.002		Illinois List of Endangered and Threatened Vertebrate Species	Illinois Department of Conservation	1978	Administrative Order
10.075		Public Notice-Re: Cleanup Proposal for Former Coal Storage Area and Blacksmith's Shop	U.S. Army, Fort Sheridan	1997 Nov 26	
10.110	*	Community Involvement Plan (CIP) for Environmental Restoration Project, Fort Sheridan, Illinois, Final	KEMRON Fort Sheridan Environmental Restoration Team	2002 Jul 01	U.S. Army FORSCOM BRAC Office
10.116		Letter re: Final Proposed Plan Objection, Coal Storage Area 3 and Landfill 5	Diambri, P.P. - Law Offices of Diambri and Caravello	2003 Apr 17	Thomsen, K.O. - Fort Sheridan Environmental Coordinator

DOC NO	I.R.	DOCUMENT TITLE	AUTHOR	DATE	RECIPIENT
10.117		Letter re: Highland Park and Highwood Comments on the Final Proposed Plan for Coal Storage Area 3 and Landfill 5	Limardi, DM - Highland Park City Manager and Huber, M - Highwood City Administrator	2003 Apr 18	Thomsen, K.O. - Fort Sheridan Environmental Coordinator
11.001		Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA (Interim Final)	Office of Emergency and Remedial Response, US EPA	1988 Oct 01	
11.002		Guidance on Preparing Superfund Decision Documents: The Proposed Plan, The Record of Decision, Explanation of Significant Differences, The Record of Decision Amendment (Interim Final)	Office of Emergency and Remedial Response, US EPA	1989 Jul 01	
11.003		Influence of Casing Materials on Trace-Level chemical in Well Water	Parker, L.V.; A.D. Hewitt; T.F. Jenkins	1990 Spring	
11.006		CERCLA Site Discharges to POTWs-Guidance Manual	US EPA	1990 Aug 01	
11.007		Technical Policy #14: Soil Volatile Sampling Procedures	Davis, S.; Otto, S.; Reside, G.; Rowe, G.T.; Tin, A.; -IL EPA	1990 Dec 17	Fendick, R., USATHAMA
11.009		Guide to Developing Superfund No Action, Interim Action, and Contingency Remedy RODs	US EPA	1991 Apr 01	
11.010		Executive Order12580, Superfund Implementation	Office of the President	1991 Oct 22	
11.012		Superfund Information Repositories and Administrative Records	US EPA	1992 Aug 01	
11.013		Guidance for Establishing the Basis for Cleanup Objectives	IL EPA	1992 Dec 01	
11.014		Certification of Adopted Amendments	Illinois Dept. of Public Health	1993 Feb 01	
11.015		Administrative Procedure #26 - Procedure for Determination of a Class II Groundwater	Liss, K.; Young, H.; - IL EPA	1993 Mar 24	
11.016		Soil Volatile Sampling Procedures	IL EPA	1993 Apr 15	
11.016.1		Presumptive Remedy for CERCLA Municipal Landfill Sites	US EPA	1993 Sep 01	
11.018		Region IX Preliminary Remediation Goals (PRGs) First Half of 1994	US EPA	1994 Feb 01	US AEC
11.019		Memorandum-re: Military Base Closures, Guidance on EPA Concurrence in the Identification of Uncontaminated Parcels under CERCLA Section 120 (h) (4)	Laws, E.P.; - US EPA	1994 Apr 19	
11.020		Administrative Procedure #11-Monitor Well Design Criteria	US EPA	1993 Dec 14	
11.020.1		Illinois Lead Poisoning Prevention Code, 77 Ill. Adm. Code 845		1994 Dec 31	
11.021		Memorandum-re: Revised Interim Soil Lead Guidance for CERCLA Sites and RCRA Corrective Action Facilities	Laws, E.P. - US EPA	1994 Jul 14	US EPA - Regional Administrators I-X
11.023		Soil Remediation Methodology Objectives	IL EPA	1994 Nov 14	
11.024		Letter-re: Illinois Register reflecting promulgated Changes to 35 Illinois Administrative Code (IAC) 620 Regulations	Nussbaum, S.D. - IL EPA	1994 Nov 23	Balliett, A.L. - Chief, Environmental Management Division, Fort McCoy
11.025		Application of the CERCLA Municipal Landfill Presumptive Remedy to Military Landfills (Interim Guidance)	US EPA	1996 Apr 01	
11.026		Control of Water Infiltration into Near Surface LLW Disposal Units, NUREG/CR-4918	U.S. Nuclear Regulatory Commission	1996 Aug 01	

Please Note: Guidance documents, statutes, and regulations listed as bibliographic sources might not be listed separately in the index.
These documents are publicly available through IEPA, USEPA and/or public libraries.

Publicly available technical literature listed as bibliographic sources might not be listed separately in the index.

DOC NO	I.R.	DOCUMENT TITLE	AUTHOR	DATE	RECIPIENT
	Documents indicated by "*" in the I.R. column are available at the information repositories as well as in the administrative record.				

APPENDIX B
RESPONSIVENESS SUMMARY

RESPONSIVENESS SUMMARY FOR COAL STORAGE AREA 3 AND LANDFILL 5 AT FORT SHERIDAN, ILLINOIS

1.0 INTRODUCTION

This document presents the U.S. Department of the Army's (Army) responses to comments on the Proposed Plan for Coal Storage Area 3 and Landfill 5 Department of Defense Operable Unit Fort Sheridan, Illinois.

In preparing this responsiveness summary, the Army followed "A Guide to Preparing Superfund Proposed Plans, Records of Decision, and Other Remedy Selection Documents," (OSWER Directive 9200.1-23P, July 1999). The responsiveness summary summarizes the views of the public and support agencies and documents in the record how public comments were integrated into the remedial decision. The guidance suggests that the responsiveness summary be organized into two sections:

> "Stakeholder Issues and Lead Agency Responses: summarize and respond to major issues raised by stakeholders (for example community groups, support agencies, businesses, municipalities, and potentially responsible parties [PRPs]).
>
> "Technical and Legal Issues, if necessary." (EPA 1999)

A public comment period was held from February 20, 2003 through April 20, 2003. Based on the comments received from citizens and support agencies during the public comment period, there are no outstanding technical or legal issues for this DD. Therefore, only the Stakeholder Issues and Lead Agency Responses section is included in this responsiveness summary. The guidance recommends, "If the lead agency determines that a point-by-point response to a set of comments is warranted, a separate comment/response document should be prepared." The Army has concluded that a point-by-point response is not warranted and has responded in this responsiveness summary to all comments submitted. Most comments and the responses are summarized by topic. Comments that pertain to a unique topic are presented verbatim.

2. 0 STAKEHOLDER COMMENTS AND RESPONSES

The Army received stakeholder comments from the City of Highland Park, the City of Highwood, the Lake County Health Department and Community Health Center, the law offices representing the City of Highwood, and a private citizen. These comments are addressed in this section.

1. Comment: Excavation and off-site disposal of CSA 3 would be preferred. There is only a small incremental cost compared to the selected remedy and would avoid potential land use restrictions and inadvertent contact with environmental contamination by the public.

Commenter: City of Highwood

Response: The remedy as proposed is sufficient to prevent inadvertent contact. There are no plans to transfer CSA 3 or Landfill 5 and current zoning is industrial/commercial. In addition, there are no zoning plans, zoning maps, or master plans indicating a different future use.

2. Comment: Excavation and off-site disposal of Landfill 5 would be preferred. The Cities of Highland Park and Highwood stated that should the land becomes available for development, they agree the area should be residential development.

Commenter: City of Highland Park and City of Highwood

Response: The Army has determined that excavation and off-site disposal is not cost-effective for Landfill 5, because excavation is not necessary to maintain the current industrial/commercial land use. In addition, there are no plans to transfer Landfill 5 or change its use.

3. Comment: The cities of Highland Park and Highwood did not receive the plan prior to the public meeting. For this reason the cities stated that there should be an additional public meeting.

Commenter: City of Highland Park and City of Highwood

Response: Copies of the plan were made available prior to the public meeting to the entire Fort Sheridan public mailing list, including Highland Park and Highwood. In addition, two public meetings were held. A public meeting was held on February 26, 2003. The 30-day comment period would have ended on March 20, 2003; however, at the request of Restoration Advisory Board (RAB) members the Army extended the public comment period to April 20, 2003 and a second public meeting was held on April 15, 2003. The meetings were announced by the Army through public notices in the local newspaper, direct mailing, and on the Army's Fort Sheridan website.

4. Comment: Does the No Further Action determination for CSA 3 include a provision for reopening the determination if the facts change? Proximity to residential use and the absence of continuing federal control are significant. Does this determination cover the finger of Bartlett Ravine that extends into CSA 3?

Commenter: City of Highland Park and City of Highwood

Response: The No Further Action determination covered the 1998 removal action area only. The proposed plan covers the area not included in the removal action. Federal control is addressed in the proposed plan through the use of land use controls (LUCs) and the partial excavation and clean fill element of the remedy addresses the proximity to residences.

5. Comment: The expression of the PAH risk at CSA 3 is misleading. This risk is 8 times two orders of magnitude greater than 1×10^{-6}. Does the Army intend to impose additional restrictions or layers of soil on land that has transferred out of the federal inventory? If so, they should describe the legal mechanism that they will rely upon to do so.

Commenter: City of Highland Park and City of Highwood

Response: The risk level of 8×10^{-4} is for a residential user in direct contact with the subsurface landfill waste. Current future land use plans for the sites is industrial/commercial.

Following remedy implementation, the ravine will be monitored to ensure the effectiveness of the remedy and maintenance or further improvements will be implemented as needed. Because the remedies will result in hazardous substances, pollutants, or contaminants remaining on site at concentrations above levels that allow for unlimited use and unrestricted exposure, a statutory review will be conducted within 5 years after the remedial action is initiated to ensure that the remedy is, or will be, protective of human health and the environment.

6. **Comment: What are the current land use restriction on adjacent land that has transferred? The Army intends to "...coordinate with the cities of Highwood and Highland Park to establish appropriate procedures to protect against future development in the area..." That seems to be a component of the remedy, and that remedy has a negative impact on adjacent non-federal land. If the cities refuse, doesn't that mean that the selected remedy is not effective in protecting human health and the environment?**

Commenter: City of Highland Park and City of Highwood

Response: Adjacent land has no restrictions and the proposed remedy is protective of human health and the environment at CSA 3 and Landfill 5 under their current land use. There are no plans to transfer CSA 3 or Landfill 5 out of federal control, however, if the sites are transferred in the future, deed restrictions or other land use controls will be required as a condition of transfer.

7. **Comment: Unless the Army wants to use the Constitutional right of condemnation of private land they cannot impose this remedy.**

Commenter: City of Highland Park and City of Highwood

Response: All the land addressed in the plan is Federal property.

8. **Comment: The cities favor an excavation of Landfill 5. It is less than 100,000 cubic yards, which is the usual cutoff for excavation. The rational for not wanting to tamper with mature trees, longer period of restoration, etc. is not accepted as valid reasons to not excavate.**

Commenter: City of Highland Park and City of Highwood

Response: There is no standard volume to determine a cutoff for excavation. As the remedy is protective of human health and the environment, it is not necessary to tamper with the mature trees and extend the period of restoration.

9. **Comment: What were the future land use scenarios considered for Landfill 5?**

Commenter: City of Highland Park and City of Highwood

Response: Because the future of private or public development of the Department of Defense Operable Unit was unknown at the time the Feasibility Study was completed, several different potential future land use scenarios were evaluated. Residential, industrial/commercial, and recreational scenarios were considered.

10. Comment: In the report, it is stated that there are no ecological risks based on future land use scenarios. It is also stated that there are potential risks to future residential or recreational land users. This is counter intuitive because ecological receptors can be more sensitive that humans.

Commenter: City of Highland Park and City of Highwood

Response: Depending on site-specific conditions, ecological receptors can be more or less sensitive than humans to various contaminants. As defined by the *Ecological Risk Assessment Guidance of Superfund: Process for Designing and Conducting Ecological Risk Assessments*, an ecological risk does not exist unless a given constituent has the ability to cause an adverse effect, and the constituent either co-occurs with, or is contacted by, an ecological receptor for a sufficient length of time at sufficient intensity to elicit the identified adverse effect. The remedial investigation concluded that there were no constituents at CSA 3 and Landfill 5 at concentrations that pose potential unacceptable risks to ecological receptors.

11. Comment: Who has the responsibility to pay for each of the scenarios outlined in Table 3? How is Kemron's contract affected by each of the proposed alternatives?

Commenter: City of Highland Park and City of Highwood

Response: The Army is responsible for paying for the scenarios. Kemron will complete the work outlined in the plan under its contract with the Army. The Army did not consider contract issues when selecting the remedies.

12: Comment: Implicit in the plan is that there will be no migration of contaminant vertically or horizontally. Given the proximity of a major water body and residential property, the basis for this should be explained.

Commenter: City of Highland Park and City of Highwood

Response: Downward migration of contaminants is not a concern because, prior sampling has shown that there was no migration of contaminant of concern into the groundwater. Upward migration of contaminants is not a concern because excavation of soil containing PAH concentrations exceeding remedial action objectives will be performed at CSA 3 and clean fill will be placed on top. Upward migration from Landfill 5 will be prevented by an impermeable cover. Horizontal migration of contaminants at either site is not a concern because, the remedies will include erosion controls designed to protect the ravine slope.

13: Comment: Specific Land Use Controls (LUCs) need to be identified and made available for the public comment period. Details also need to be provided on implementation, monitoring, reporting, and enforcement of selected LUCs. Concerns between the Army, EPA and Illinois EPA for proposed LUCs need to be resolved and concurrence obtained from the regulatory agencies. All pertinent information regarding LUCs and the Memorandum of Agreement between the Army and regulatory agencies needs to be incorporated into the Record of Decision.

Commenter: Lake County Health Department and Community Health Center

Response: The Proposed Plan had a 60-day comment period. The plan stated that deed restrictions will be required as a condition of transfer. Specific deed restrictions will be determined at the time of the transfer. Since issuance of the proposed plan, the Army and the Illinois EPA have developed additional LUCs that are described in detail in the final Decision Document and Design Documents for CSA 3 and Landfill 5.

14: Comment: Design drawings for the proposed cover need to be made available during the public comment period.

Commenter: Lake County Health Department and Community Health Center

Response: Design drawings are typically produced after a decision is made; therefore, design documents were not available at the proposed plan stage of the decision making process. Poster presentations were made at public meetings describing the alternatives including the covers for CSA 3 and Landfill 5.

15: Comment: It appears that the proposed alternative is designed only for the current intended use, a paved parking lot. If maximum flexibility is honestly intended, the landfill should be covered with a uniform impermeable cap that is protective of public health and the environment prior to constructing a parking lot. If someday the property is transferred, Landfill 5 could be used for other purposes such as recreation or open space without major reconstruction.

Commenter: Lake County Health Department and Community Health Center

Response: The alternative was selected because it is protective of human health and the environment for the current and future planned use which is industrial/commercial. At this time there are no plans for transfer of CSA 3 or Landfill 5. The land use controls selected for CSA 3 and Landfill 5 prevent any intrusive activities and prohibit residential use.

3.0 SUPPORTING AGENCY COMMENTS AND RESPONSES

The U.S Environmental Protection Agency (EPA) and Illinois Environmental Protection Agency (Illinois EPA) are the supporting agencies for the actions at CSA 3 and Landfill 5 and have participated in the development of the feasibility study, the proposed plan and the decision document. Over the years of their participation, the agencies have submitted numerous letters and other communications regarding issues at CSA 3 and Landfill 5. All of these communications can be reviewed in the administrative record.

This section of the responsiveness summary contains the Army's responses to the supporting agencies' comments submitted during the public comment period on the final proposed plan for CSA 3 and Landfill 5. These comments come in the following letters:

1. Illinois EPA Letter of April 18, 2003
2. EPA Letter of April 21, 2003

The Army responded to each letter in two separate letters dated May 23, 2003. These letters are included in the administrative record. The agencies' comments and the Army's responses from these letters are given below.

U.S. EPA, Illinois EPA Comments and Army Responses:

Issue: The details of the alternative described in the draft technical memorandum distributed at the April 15, 2003, BCT meeting are different from the alternative in the proposed plan. In addition, the proposed alternative was not included in the feasibility study (FS) and was not discussed with the BRAC Cleanup Team (BCT) before dissemination to the public. Therefore, the decision making process, including the FS and the public comment period, should be reopened before a final remedy is selected.

The preferred alternative as described in the draft technical memorandum was completely consistent with the proposed plan. The preferred alternative is a hybrid of two alternatives presented in the approved FS. The purpose of the draft technical memorandum was simply to provide additional information about the preferred alternative. The memorandum restated the specifics of the cover design for Landfill 5 and explained how the design will meet the pertinent requirements of Illinois EPA regulations, but it did not introduce a new alternative.

Since the public comment period, considerable additional discussion between the Army and the Illinois EPA has resulted in additional detail being added to the descriptions of the preferred alternatives for CSA 3 and Landfill 5 and conditional approval by Illinois EPA of the design elements for the alternatives. This detail has been memorialized in the final Decision Document.

Issue: The applicable or relevant and appropriate requirements (ARARs) for each alternative in the FS for Landfill 5 have been negotiated and agreed upon, and the "new" alternative is reopening these discussions. If the Army wants to renegotiate the ARARs for Landfill 5, the FS process must be reopened.

As explained above, the Army and Illinois EPA have discussed the preferred alternative and ARARs in great detail since the public comment period resulting in conditional approval by Illinois EPA of the design elements for the alternatives for both sites. These approved design elements and the accompanying ARARs are memorialized in the final Decision Document.